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Original Communications.

*NEW THERAPEUTIC AGENCIES.**

LECTURE VIII.—NEW MODES OF TREATING PULMONARY TUBERCULOSIS.†

By Professor Dujardin-Beaumetz,‡ Paris, France.

GENTLEMEN:—The critical study of the new modes of treating pulmonary tuberculosis, to which I now invite your attention, is one of the most difficult of subjects; therefore, at the onset of this lecture, I claim your indulgence.

I do not intend a complete study of these new therapeutic methods, and shall not repeat what I have said elsewhere in the Therapeutic Gazette and in the last edition of my work on "Clinical Therapeutics."§ I shall only dwell on facts which have been brought before the profession during the last three years.

Since Koch, confirming the discovery of Villemin, has shown us in the tubercle bacillus the virulent agent of tuberculosis, numerous

* A second series of "New Medications," published in 1887.

† From advance sheets, revised by the author (translated by E. P. Hurd, M.D.). Lectures delivered in Cochin Hospital, Paris, France.

‡ Member of the Academy of Medicine, Physician to the Cochin Hospital, Paris, France.

§ Therapeutic Gazette, November 15, 1887; Dujardin-Beaumetz, "Leçons de Clinique Thérapeutique," t. ii. Part III.

attempts of therapeutists have been directed against this micro-organism, and the endeavor has been made to establish on scientific bases the antibacillary treatment of phthisis. Have experimenters succeeded? Unhappily no, and if undoubted progress has been made since the discovery of Koch, it is only in the line of hygienic therapeutics and prophylactic hygiene.

Must we, then, despair? By no means; for at the very moment when I utter these words, Koch's announcement has been made that, by a method still, for sufficient reasons, kept secret, he has been able to render animals refractory to tuberculosis. Nay, more, experiments now going on in the hospitals of Berlin under Koch's supervision seem to give promise of most important results in the suppression of phthisis in the human subject by a method of attenuated vaccine similar, it may be, to the processes already applied by Grancher and Hippolyte Martin to animals to render them refractory to tubercle inoculations.*

With regard to the practical results of experiments on animals, I know very well that it is not always safe from laboratory experiments to form conclusions as to what will benefit the human subject under inherited or acquired disease; and it may be objected to the researches of Grancher and Martin, that, from the point of view of the treatment of tuberculosis, what we want is not merely to find some means of preventing animals from becoming subjects of experimental tuberculosis, but also of arresting the development of tuberculous lesions when the bacillus has sojourned for a certain time in the economy.

It would be a great mistake, nevertheless, to make light of such researches. We can always derive from them precious knowledge, and it may be affirmed, thanks to the ardor with which these researches are pursued in all the great scientific centres, that, guided by experimental medicine, and basing ourselves on incontestable bacteriological labors, we shall be able some day, not only to render persons predisposed to tuberculosis refractory to this disease, but even to arrest the development of Koch's bacillus. In such investigations I have personally a keen interest, and you can follow in my laboratory a series of similar experiments undertaken on animals by my pupil, Dr. Stackler.

But, to come back to our subject, clinical experimenters have proposed a multitude of medicaments which seem to have a special microbicide action on the tubercle bacillus; and, in order to reach the pulmonary parenchyma more directly, they have generally abandoned the method of introduction by the alimentary canal for that of the subcutaneous tissues and the lungs.

In my "New Medications," under the head of "New Pulmonary Medications," I have already spoken of the attempts made to introduce certain therapeutic agents by the rectum; this method is to-day completely abandoned. The direct injections into the pulmonary parenchyma have undergone the same fate, and it does not seem that this method will ever again come into vogue, notwithstanding the attempts lately made by Fernet.†

It is not the same with inhalations, and we have seen successively sulphurous acid and hydrofluoric acid employed.

As for the first of these gases, the experiments which I have made in my hospital, and which have been reported in the thesis of my pupil Darieux,‡ have shown that, if these ininhalations sometimes give satisfactory results, amelioration is rare, and we never see the bacillus disappear from the sputa. Hence, the facts adduced by Sollaud, Auriol, and Balbaud are quite exceptional.§

My pupil Villy undertook to practise subcutaneous injections of sulphurous acid dissolved in liquid vaseline. These injections did not produce any beneficial effect.‖

The hopes which had been raised by the first experimental researches made in my hospital wards by Chevy with hydrofluoric acid¶ have not been realized; and, despite the vogue which this treatment had after the important communication of Herard to the Academy, to-day these hydrofluoric inhala-

* *Vide* Grancher and Hippolyte Martin, in *Acad. des Sciences*, August 10, 1890.

† Fernet, "On Parenchymatous Injections of Naphthol in the Treatment of Pulmonary Tuberculosis" (*Bull. et. Mèm. de la Soc. de Thèrapeutique*, 1889).

‡ Darieux, "Treatment of Pulmonary Tuberculosis by Inhalations and Hypodermic Injections of Sulphurous Acid" (*Thèse de Paris*, 1887).

§ Auriol, "Treatment of Pulmonary Phthisis by Inhalations of Sulphurous Acid;" Sollaud, "Two Cases of Pulmonary Phthisis treated with Success by Prolonged Sojourn in an Atmosphere of Sulphurous Acid" (*Archives de Mèdecine Navale*, 1887); Balbaud, "On Sulphurous Acid in Tuberculosis" (*Bull. de Thèr.*, 1887, t. cxiii. p. 276).

‖ Villy, "Hypodermic Injections of Sulphurous Acid" (*Bull. de Thèr.*, September 15, 1887).

¶ Chevy, "On Hydrofluoric Acid and its Therapeutic Applications" (*Thèse de Paris*, 1885).

tions are completely abandoned. In fact, as you have seen in my wards, where I have had little cabins constructed for the purpose, if hydrofluoric inhalations have produced amelioration in certain cases, it has proved itself powerless in the immense majority of instances to arrest the progress of tuberculosis.

In Russia, Kremianski has constructed very ingenious inhalers, by the means of which air is made to pass through aniline solutions. He adds to this treatment the internal administration of aniline, and combats the febrile symptoms by acetanilide. He has reported several cases where aniline, which is a powerful antiseptic, has given favorable results. These trials have not been repeated in France, but you will find in the published monographs of Albitzky, Goliskowsky, Gretchinsky, and others data which plead in favor of the method.*

I must remark, *à propos* of aniline and its derivatives, that in his communication to the Berlin Congress in 1890, Koch mentioned, among the substances which oppose the culture of bacilli *in vitro*, fuchsin, gentian violet, methylene blue, quinoline yellow, and auramine, all coloring substances derived from aniline. To this list he adds naphthilamin-β, paratoluidin, and xylidin; lastly, of pre-eminent efficacy, cyanide of gold, which arrests the development of tubercle bacilli in a solution 1 : 2,000,000. Unfortunately, when we pass from the domain of the laboratory to that of clinical medicine, this microbicide action is no longer seen, and it is to be feared that this may be the case with Professor Kremianski's method.

Struck with the confessedly incomplete results which have been obtained by the inhalations of different substances reported to be microbicide, Weigert, an American physician, abandoning medicinal agents, conceived the idea that hot air, which is considered as one of the most active destructive agents of micro-organisms, might be utilized in the treatment of pulmonary phthisis, and he constructed an apparatus which heats the air to a temperature the highest point of which is 250° F.

In proposing this method he was but following out a line of practice which had been before adopted by Halter and Krüll, of Gustrow, who had employed hot air in the treatment of tuberculosis. Halter got his idea from the fact that the workers in lime-kilns seemed to be exempt from phthisis.

The experiments made in my hospital wards, as well as in the different countries of Europe, have shown how illusory was the hope entertained by Weigert.

In Russia, Korkourioff has shown that Weigert's method not only does not cure tuberculosis, but that it even favors the more rapid progress of the disease. This is the conclusion also arrived at by Dr. Trudeau, of Saranac Lake. Besides other American physicians, Cary and G. Thomson have also reported bad results from the method of Weigert. Cervello, who has also made numerous hospital experiments with the hot-air treatment in Italy, has come to the same conclusions, and the same may be said of Nijkamp, of Leyden.

Taylor has shown by thermometric examinations of pulmonary cavities, that air, heated up to 200° F. in Weigert's apparatus, did not raise the temperature of the air in the lungs more than half a degree. But we are indebted to an Italian physician (Alberto Riva, of Parma) for the most numerous and precise experimental investigations relative to the temperature of the air in the interior of the throat and pulmonary parenchyma, and he has shown that the temperature of the intrapulmonary air never exceeds 40° C.

On the other hand, in a series of researches which I have undertaken with the aid of my laboratory chief, Dr. Dubief, I have shown by experiments on animals that it is necessary, in order to destroy the virulence of the bacilli of tuberculosis in sputa, to exceed at least a temperature of 80° C. At 70° C. we find this virulence still existing.

So, then, from the point of view of the destruction of the micro-organisms of the lungs, clinical experiments and experimental researches show that we can base no hope on

* Albitzky, "Sur un Cas favorable du Traitement de la Phtisie chez ma Femme" (*Revue Médicale, Meditzinkoyé Obozrénie* [en russe], 1886, et *Lancet*, 1888, No. 9); Goliskowsky, "Sur quelques Cas de Prophylaxie et du Traitement de la Phtisie" ([en russe] *Wiestnik Obchestmennoy Guiguiéni*, Avril, 1889), publié séparément avec l'article du Professeur Kremiansky,—"Sur l'Emploi du fer dans le Traitement de la Phtisie" (en russe); Gretchinsky, "La Médication par l'Aniline des Maladies chroniques des Organes respiratoires chez les Prisonniers" (*Médecine russe, Rousskaya Méditzine*, 1889, Nos. 22, 23 [en russe]); Ouréwitch, "Guérison de la Tuberculose en Trois Mois" (*Rousskaya Méditzine*, 1889, No. 48); Zislinsky, "Sur la Nécessité d'Examen microscopique fréquent des Crachats" (*Méditzinskoyé Obozrénie*, 1889, No. 5); Polétika, "Traitement de Phtisiques par les Inhalations d'Aniline" (Société des médecins russes de Saint-Pétersbourg, 26 Octobre, 1889. Cité en abrégé par le docteur Wladislowlew, dans le *Wratch*, 1889, No. 44).

the employment of these inhalations of superheated air.*

Detances, who has made himself in Paris the advocate of the *azotized method of treatment*, maintains that it is beneficial in tuberculosis. Without daring to affirm that nitrogen has a direct microbicide action, he considers this azotized medication as one of the most powerful means for raising the forces of patients and modifying the culture soil. He employs the azotized water in drink and in pulverizations, as well as in inhalations of nitrogen gas. You will find in the thesis of Dr. Mazery † several cases reported where, under the influence of this treatment, undoubted improvement took place.

Quite another method has been recommended by Stormer, of Christiana, for the introduction of medicinal substances into the lungs. It is under the form of extremely fine particles that these substances are made to penetrate the lungs, and to accomplish this he pulverizes or sprays certain medicinal agents in solution in a room whose temperature is raised considerably above the normal (from 105° to 110° C.). Under the influence of this high temperature, the water of the solution evaporates, and the medicament escapes from the apparatus in a dry and very fine powder.

The manner of carrying out this mode of treatment is represented by the two apparatuses which I place before you ; one may serve for two patients ; the other, which is larger, can be used for only one (Fig. 1).

FIG. 1.

Recently Stormer has modified his apparatus, and has given it a much more simple form, as you can see by the model I here show you. Stormer is but carrying out the intrapulmonary mode of treatment instituted by Jacobelli, of Naples, with his atmiometer (see THERAPEUTIC GAZETTE, 1887, page 729).

Whatever may be the fineness of the medicinal powders, they really penetrate but a little ways into the lungs (when they get there at all), and it is impossible to admit, supposing the most favorable conditions, that they can act with sufficient power to destroy *in situ* the bacilli of tuberculosis. I adopt, then, the conclusion of Aubeau and Ley, who first made known Stormer's apparatus in France, that we can utilize this method in order rapidly to introduce certain medicinal substances in the case of individuals whose stomachs are irritable and reject medicines.

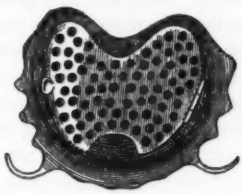
It is on quite another basis that the inhaler of Dr. Pradère de Moine is established. He places on the roof of the mouth an apparatus very similar to a dental plate, and fixed like the latter, containing a closed cavity, in which are introduced the medicinal sub-

* Ley, "A New Apparatus destined for the Treatment of Phthisis" (*Bull. de Thèr.*, t. cxviii. p. 193); Korkounoff, "Treatment of Tuberculosis by Hot Air, after Weigert's Method" (*Wratch*, No. 43, 1889); Trudeau, "Inhalations of Hot Air in the Treatment of Pulmonary Phthisis" (*Chicago Medical Journal*, October 5, 1889); Cervello, "Inhalations of Hot Air with Weigert's Apparatus" (*La Sicilié Medica*, 1889); Nijkamp, *Centralblatt für Laryngologie*, January, 1890; Taylor, Clinical Society of London, May 23, 1890; Riva, "Treatment of Pulmonary Tuberculosis by Weigert's Apparatus" (*Il Morgagni*, May, 1890); Thomson, "Inutility of Hot Air in the Treatment of Phthisis" (*Med. Record*, April 26, 1890, p. 457); Cary, "Treatment of Pulmonary Tuberculosis by Hot Air" (*Brooklyn Med. Journal*, 1890).

† Mazery, "Nitrogen in Mineral Waters" (*Thèse de Paris*, 1890).

stances (Fig. 2). These substances are in the form of flat pastilles, like the cavity in

FIG. 2.



which they are placed. The following is one of the formulæ of these pastilles:

℞ Phenic acid, 30 grammes;
Thymic acid, 10 grammes;
Essence of myrbane, 10 grammes;
Balsam of tolu, 50 grammes;
Saccharin, 20 grammes. M.

Add sugar, gum tragacanth, laminaria, and licorice powder enough to make a thousand pastilles.

FORMULA NO. 2.

℞ Chromic acid, 2 grammes;
Essence of myrbane, 20 grammes;
Balsam of tolu, 50 grammes;
Saccharin, 20 grammes. M.

The above is sufficient for a thousand pastilles.

It takes three or four hours for these pastilles to dissolve, and patients renew them three or four times a day.

Dr. Pradère has made application of his system to several patients in my hospital, who have derived a real benefit therefrom, but we have not observed a real cure. Moreover, the method is still under trial, so that we cannot yet pronounce definitely concerning its value.

Onimus uses for an inhaler that lamp today employed as a disinfectant, and which operates on the principle of the transmission of alcohol vapors over platinum black kept incandescent by these vapors. In this case ozone is produced, which rapidly destroys the bad odors of the room in which this lamp is placed. By mixing with the alcohol essences of thyme, lemon, and eucalyptus we obtain an antiseptic action, which may possibly destroy the virulence of the tubercle bacillus.

Onimus affirms that, by causing the products which are set free from this lamp to pass, by the aid of an aspirator, through tuberculous sputa kept in Liebig's tubes, the virulence of these sputa is absolutely destroyed. He thinks this method useful, not in promoting the cure of tuberculosis, but in palliating the deep lesions of the pulmonary parenchyma.*

* Onimus, "On the Destruction of the Virus of Tuberculosis by Certain Essences made to Evaporate by Platinum Black" (*Acad. des Sciences*, October 6, 1890).

So, then, after having passed in review all these new processes of antiseptic inhalation, you will remark that no one of them has given positive results, and confirmed the expectations of their authors. Have we been any more successful with the subcutaneous injections? This is what we shall now examine.

Of all the balsamic or other substances employed in pulmonary tuberculosis, one only seems to hold its ground amid the multitude of pretended specifics that have had their day and gone into oblivion. I refer to creosote.

Already, at the time of my journey to Russia, I had been struck by the results obtained by Affanassiew from the employment of creosote in large doses administered by the stomach. But it is so rare in tuberculous patients to find stomachs sufficiently tolerant to support doses of creosote, equalling and even exceeding one gramme, that this method is little practicable. But we can easily introduce this medicament under the skin, and it is here that the researches and experiments of Gimbert have taught us something.

We know how much we owe to Gimbert for the application of creosote to the therapeutics of tuberculosis; we may almost say that he is the founder of this treatment. For many years he has utilized both the gastric and hypodermic methods for the administration of this medicine, and it was under his guidance that I began those clinical trials which are still continued to-day in my hospital wards.

At the hospital I make use only of the subcutaneous method. I have used the Gimbert injector, and another apparatus which I have had constructed, but whose results are less satisfying. It is sufficient to have a hypodermic instrument similar to the primitive Pravaz syringe which may hold fifteen to twenty grammes of the medicinal solution.

Burluraux, who has made much use of creosote in large doses in the military hospitals, utilizes the pressure of the liquid. A reservoir, placed at a suitable height, communicates, by means of a rubber tube, with a perforated needle, which is introduced under the tissues, and gradually and very slowly, for several hours, the creosote solution penetrates into the cellular tissue.

The solution to employ is the following:

Pure creosote, 10 grammes;
Pure olive oil (sterilized), 150 grammes. M.

I call your attention to the necessity of having the olive oil as pure as possible and sterilized. This sterilization is easily effected to-day in the bacteriological stoves, and it suffices to raise the temperature of the liquid above 120° C.

To practise these injections, you must always take great care, before introducing the liquid, to see that it is perfectly pure, and for this purpose you need only to let fall upon a porcelain plate a few drops of the solution by means of the instrument which you are going to use. These drops should be perfectly limpid, and clear of all the impurities resulting from rusting of the stop-cocks of the apparatus, or a foul condition of the piston or the needle.

When once you are sure of the purity of the solution and the cleanliness of your needle, you will proceed to the injection. The best place, in my judgment, is at the posterior part of the thorax, near the spine of the scapula. At this point the cellular tissue is very loose, and may without inconvenience receive great quantities of the liquid. You pinch up a fold of skin, and at the base of this fold and parallel to it you introduce the needle. The injection should be made very slowly; then, when it is finished, you withdraw the needle and place your finger over the orifice to prevent escape of the liquid.

When made with all the precautions which I have indicated, these injections never cause any local mischief, and we have yet to see the first abscess produced as a result of these subcutaneous injections practised in our wards, where they are generally left to students. Moreover, these injections are but slightly painful, and are generally welcomed by the patients, who find them a real comfort and benefit.

In a space of time, which varies from five to ten minutes, the breath of the patients takes on the characteristic odor of creosote, and this odor persists for twelve hours. These injections are made every second day.

Under their influence we see produced a diminution of the expectoration, a return of the appetite, disappearance of the night sweats. In the cases which I have had in the hospital under my observation, I have never witnessed a cure, and this is due chiefly to the fact that it is but a short time that we have had our patients subjected to this treatment. But Gimbert, who has exercised an extreme reserve in the publication of his hospital cases,—a reserve which we cannot too much approve of when the treatment of tuberculosis is concerned,—has, at the same time, affirmed that he has witnessed in a certain number of cases the definitive cure of tuberculous consumption under the influence of these subcutaneous injections of creosote.

Is this method applicable to all cases? Assuredly not. There are contraindications which it is necessary to know; one of the first is fever. In all cases where the temperature is continuously high, these injections do more harm than good. It is the same with hæmoptysis. In a word, the active congestions of the lung, whatever may be their cause, constitute a formal contraindication, which is easy to be understood when you reflect that the elimination of creosote tends to augment the pulmonary hyperæmia. It is, then, in the slow, apyretic forms that there is the most chance of success.

As you have just seen, the therapeutics proper of diseases of the lungs, despite the earnest labor spent in this direction, has not greatly progressed, and, with the exception perhaps of creosote, all the other microbicide medicaments directed against the tubercle bacillus have been attended with far more failures than successes, whether used by inhalations or subcutaneously.

We must, then, wait for the results of experiments undertaken in the different laboratories before we shall know whether science is in possession of a method or a medicament which can destroy the virulent agent of phthisis in patients affected with tuberculosis.

But, on the other hand, prophylactic hygiene has made great advances. Knowing the contagious agent of the disease and its mode of transmission, we can to-day establish on scientific bases the prophylaxis of this disease. We can even do more; we can apply these same data, derived from hygienic therapeutics, to the treatment and cure of tuberculosis.

I shall have, then, to set before you successively the prophylaxis of tuberculosis and the hygienic treatment of this disease, and shall try to indicate the progress that has been effected during the last few years.

I shall be brief under the first head, for you will find this subject pretty thoroughly treated in my "Prophylactic Hygiene." I desire only to sum up the principal points of this subject.

Quite vehemently discussed at the recent Congress of Tuberculosis, which was held in 1888, these questions of prophylaxis came up again before the Academy in 1889, and ob-

tained the unanimous vote of the Academy on all the points of which I am going to speak.

The contagious agent of tuberculosis is the sputum. We may say that it is almost the only agent of propagation of the disease. I say *only*, for authorities have pointed to cases where the sperm was said to be the agent of infection. But such cases are very questionable, and they are extremely rare. Others have also alleged the food to be a possible cause of contagion; to this point I shall refer again.

Apart from particles of dried sputa, which may float about in the air, the atmosphere does not contain tubercle bacilli, and in this regard the experiments of Giboux and those of Tappeiner seem absolutely demonstrative.

It is, then, to the destruction of these sputa that hygienists have for the most part applied themselves. It is, therefore, necessary whenever and wherever tuberculous patients are congregated in the same dwelling or apartment, or whenever you are called upon to attend tuberculous patients, to exact of them that they shall spit into special receptacles containing saw-dust or sand moistened by disinfectant mixtures, or even simply by water. Then every evening it should be made a duty to destroy by fire, or by steam under pressure, the contents of these spittoons.

Iscovesco has even recommended (and it is a clever notion) to have the spittoons made of pasteboard, and to see that they are destroyed every day along with the sputa.

To save the products of expectoration and to destroy them is not sufficient. The room which the patient has occupied, the garments which he has worn, the bed-clothes which have been in contact with him, must be disinfected. This is a requirement which cannot be with safety neglected, and you will find in medical annals a great number of facts showing that individuals have become tuberculous by inhabiting a room or tenement long occupied by a phthisical patient. All the rules of disinfection, which I have indicated in my "Prophylactic Hygiene,"* are applicable, and you should see that they are rigidly enforced.

This necessity of the disinfection of rooms occupied by the tuberculous makes it also incumbent on us to see that the appointments of these rooms are of a proper kind. Peter long since rightly raised his voice against the hangings and tapestries which encumber these apartments. To-day it is a matter of absolute necessity to do away with these hangings, and the walls of the room, the floor, and the mattings which cover the floor should be of such a character as to allow frequent washing. Here there is a great reformation to be accomplished, especially in the hotels and lodging-places for invalids, to-day so numerous on the borders of the Riviera, and the changes called for must more or less modify profoundly the conditions of comfort to which phthisical patients have been habituated. We shall presently see that a modification quite as great should be effected in the aeration of the rooms occupied by the consumptive.

As for the question of aliments as a cause of the contagion of tuberculosis, this has given rise to vehement discussions, and by turn parties have incriminated both milk and meat. As for milk, it seems to be demonstrated, experimentally at least, that it may transmit tuberculosis; and Puech has rendered guinea-pigs tuberculous by feeding them on the milk of a tuberculous cow. Ebstein, Hort, and Cohnheim have made similar experiments, and have arrived at identical results.

Milk, then, which contains tubercle bacilli may cause tuberculosis; but, as I have already said in my "Prophylactic Hygiene," cows which give tuberculous milk are extremely rare; and, in view of this rareness, I do not believe it to be necessary always to subject to ebullition the milk which is administered to children; boiling, in fact, renders the milk more indigestible. Moreover, we can avoid this danger of the propagation of tuberculosis by using the milk of animals refractory to tuberculosis, such as the ass and the goat, or even those sterilized milks which are found to-day in commerce, and of which an important manufactory is established in Normandy, at Neufchâtel-en-Bray.

As for meats, I shall not repeat what I have already said in my "Prophylactic Hygiene." In view of the contradictory results obtained by the most conscientious experimenters (Nocard, for instance), in view of the known destructive action of the gastric juice on the tubercle bacillus, I am of opinion that there is not yet sufficient warrant for prohibiting the use of raw meat and underdone meats, on the pretence that there is danger of transmitting tuberculosis in this way, and the commission of the Academy has accepted the

* Therapeutic Gazette, 1888–89.

reservation which Germain Sée and myself formulated in this regard.

Such, in brief, are the most important points in the prophylaxis of tuberculosis, and I come now to the subject of the open-air treatment, which has revolutionized in many respects the treatment of pulmonary affections.

This treatment comprehends several factors. First, it is essential that the patient shall spend as much time as possible in the open air; then, to keep him in a relative repose, he should be in a proper sanitarium. We will successively examine each of these points.

The importance of fresh air in the treatment of the tuberculous has only of late been sufficiently brought to light; and, although Raulin, in the eighteenth century, taught in very precise terms the necessity of making consumptive patients live in rooms with the windows wide open, it must be admitted that this precept has not been followed, and what proves this is the difficulty which our clinical leaders find in convincing the public of the importance of the complete aeration of the rooms of the tuberculous. Peter, who has made such vehement opposition to the curtains and hangings which encumber the rooms of the phthisical, is one of the most ardent advocates of the thorough ventilation of these sick-rooms.

Open the works of Jaccoud, G. Sée, Cornil, and Herard, and you will find this matter of abundant aeration for the tuberculous strongly and repeatedly insisted upon.

But all these injunctions and precepts were anticipated many years ago by an Englishman, who has done much for the treatment of tuberculosis. I allude to Bennett, who, in his "Treatise on Pulmonary Phthisis" (1874), indicated how the tuberculous ought to live in the open air.

"The consumptive," he says, "ought to live day and night in an atmosphere kept constantly pure by a current of air made to traverse the room from a window more or less open all the time to a fireplace or chimney, also kept open."

But, notwithstanding all these precepts, the open-air treatment of phthisis was little in favor of the profession, and we are indebted to Dettweiler* for having again urged its importance and proved its utility, so that at the present day this treatment is commending itself more and more.

Dettweiller, as you know, superintends, at Falkenstein, in the Taunus, a few hours' ride from Frankfort-on-the-Main, a sanitarium, built at an altitude of four hundred and forty metres, where he subjects his patients to a treatment based almost exclusively on the use of fresh air, and in several communications he has made known the results of his practice, which are certainly remarkable.

I shall not take up your time with a full description of this mode of treatment. I have stated it fully in a report which I presented to the Academy on the occasion of a communication by Dr. Nicaise on this subject, and showed how fully I believe in this fresh-air cure.

But, dating from this epoch in the therapeutics of tuberculosis, numerous researches undertaken along this line have made known to us facts with which we were previously unacquainted. I refer to such as the temperature of a room, with windows open night and day.

Onimus, on the one hand, in showing us that the temperature in the night-time on the Mediterranean coast, between Hyères and Menton, instead of falling, continues to rise, and that where a fall takes place, it is at the day-dawn; and Nicaise, on the other hand, in showing that a room, with its windows constantly open, keeps a mean temperature of 12° to 14° C., even when the temperature outside is below zero, have put in clear light the possibility under certain given conditions of sojourning in a room with windows open without inconvenience or harm.†

The remarkable experience of Dettweiller, which has to do with a large number of patients, shows even that in climates less mild than the borders of the Riviera, we may obtain the same result. At Falkenstein, in fact, the patients, from eight o'clock in the morning till ten o'clock at night, remain exposed under a veranda largely open and protected only by curtains against the rain, the wind, or the snow; and, in the evening, when these patients go to their rooms, they pass the night in an apartment whose windows are open, and the proportion of relative cures in this establishment is estimated at 24.2 per cent. accord-

* Dettweiller, "Die Therapie der Phthisis," etc. Wiesbaden, 1887.

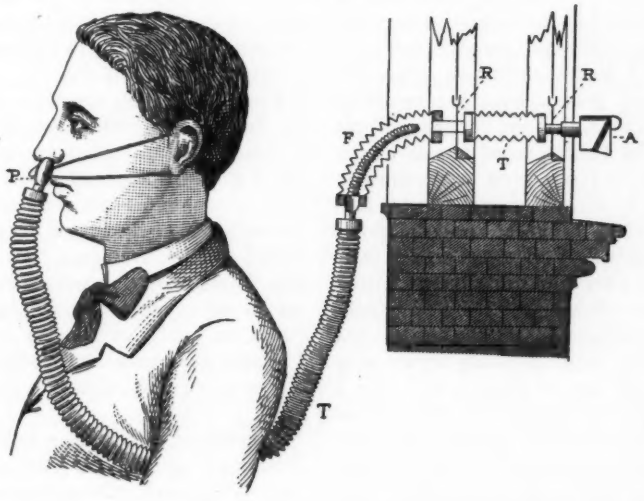
† Onimus, "Researches on the Thermometric Variations from the Point of View of Hygiene" (*Bull. de Thér.*, 1890, t. cxviii. p. 300); Nicaise, "On Permanent Aeration by Open Windows" (ibid., p. 241); Dujardin-Beaumetz, "Report to the Academy of Medicine," February 25, 1890.

ing to Dettweiller, and at twenty-seven per cent. according to Meissen.

In our hospitals certain physicians have attempted to make their tuberculous patients live in rooms with open windows, and I may call your attention to trials made by Debove, Constantin Paul, and my own at the hospital Cochin, where I have made use of a window quite ingeniously constructed by Eyraud.

Physicians imbued with these ideas have contrived numerous processes to render respiration in open air more efficacious, without endangering patients, and the most ingenious apparatus which has been constructed for this purpose is that which I here show you, and which you have seen in operation in my wards (Fig. 3). A slender tube of parch-

FIG. 3.



ment-paper brings the nares of the patient into communication with the outer air. The inflowing air (at *A*) is protected from the wind and dust by clapper valves very ingeniously arranged. Before reaching the respiratory organs of the patient, the air traverses a layer of wadding (*F*), which still further filters it. As for the nasal end, it is kept in place by two elastics, which pass around the ears. A valve, with which the mouth of the tube is furnished, enables the expired air to escape directly to the outside. This same distal end contains in its inside a piece of blotting paper, which may be impregnated with soluble substances, such as creosote, phenic acid, eucalyptol, etc.

Patients who are furnished with this apparatus seem to derive a real benefit from it, and they sleep without experiencing any inconvenience from the presence of the tube in the nose.

It would be well, by the way, to mould the extremity of the tube to the nares which it is designed to penetrate, so that it may adapt itself perfectly to that cavity, and not permit the passage of the air of the room between the nasal walls and the tube.

I am experimenting at the present time with the apparatus of Wolff* in my hospital wards, and patients wear this apparatus without inconvenience, and are highly pleased with its results.

In any event, whether you make use of the apparatus, or, what is much more simple, the open-window treatment, you should see that the blinds are shut, the windows being opened in such a way that no draughts can come upon the patient. The patient must, of course, be well covered and kept perfectly warm in his bed.

The second point to which I desire to call your attention is the necessity of repose. In his interesting work, "On the Hygienic Treatment of Tuberculosis," Daremberg dwells much on this subject of rest in the treatment of phthisis; in his estimation, it is the best means to diminish pulmonary congestions. Once, he says, physicians were in the habit of saying to patients, "Go South and take constant exercise." Now they are more in

* Wolff was the originator of this apparatus, which was shown to the Congress of Physicians of Southern Germany in 1885.

the habit of advising them to go South and keep quiet in bed. Dettweiller, moreover, urges his patients to rest, and he keeps them on their backs the greater part of the day, allowing them only occasional promenades in the park which surrounds his establishment, and this only when there is a real improvement in their condition.

Daremberg provides the means of rest for his patients by furnishing them with little osier basket-cots, to which he adds the invalid long-chair.* I cannot too much recommend to you to take a hint from this mode of promoting the comfort of phthisical patients.

Fresh air, rest, and, lastly, alimentation, these are the most important points in this hygienic treatment. I shall say little of alimentation and superalimentation; you know my views on this subject, and that I have been one of the most earnest advocates of superalimentation in tuberculosis. I may say that every consumptive patient who has a good stomach and a healthy digestive apparatus has relatively a good chance for recovery. It is desirable, then, that the patient shall eat abundantly, and I recommend you to advise particularly fatty foods, such as sardines in oil, tunny-fish in oil, sour herring in oil, butter, pork, the fat of geese, pork-butcher's meat, caviar, cod-liver oil, sweet cream, etc.

I would not advise an exclusively azotized diet, and I am much in the habit of recommending vegetables and starchy foods. On the other hand, it is necessary to be very moderate in the use of alcohol, and here I differ entirely from Dettweiller. Dettweiller gives much alcohol to his patients, thus following the practice instituted thirty years ago or more by Furster, of Montpellier, who claimed to have found the means of curing his patients by giving them raw meat and alcohol.

I recognize the fact, however, that in this proscription of alcohol the habits of one's country play a great part, and what the stomachs of us Frenchmen cannot support, may be easily tolerated by the stronger stomachs of the English or Dutch. I prefer much to the distilled liquids the fermented milks, such as koumiss and kéfir.

As for the third point,—*i.e.*, the desirability of providing suitable sanitariums for our patients,—the example set by Dettweiller seems to have borne its fruits, as we see to-day sanitariums established in France. There is, in fact, a considerable advantage, when one undertakes the treatment of tuberculosis, in having the patient before his eyes and under his absolute supervision. Separated from his family, the patient obeys the orders of his physician much better, and it is possible to enforce the rules of a regimen which may seem at first to be too difficult and severe; and, in the discussion which followed the introduction of this subject at the recent Berlin Congress, all the members present seemed to be in favor of these special sanitariums.

Nicaise † has given us some precise directions as to the conditions which a sanitarium for the phthisical shall fulfil, and he has submitted to the Board of Public Charities a carefully-considered plan. The hospital boards are, in fact, to-day favorably disposed towards the establishment in suitable climates of special hospitals, where phthisical patients of the working-class may obtain all the benefits of the open-air treatment hitherto reserved for the rich classes.

I know very well that here in France we are behind the times, and that this word *hospitalization* will frighten many patients. But if the advantages of this mode of treatment in such a disease as pulmonary phthisis are set forth, I believe that the scruples of the public will be overcome. If, moreover, the proprietors of these sanitariums endeavor to render the sojourn at these places agreeable (what can hardly be said yet of Falkenstein), I believe that we shall have overcome the prejudices which exist relative to these *maisons de santé*.

I speak of the sojourn being agreeable; diversions, in fact, are indispensable to the tuberculous, and, without encouraging a resort to the dissipations of our sea-coast towns, I believe, nevertheless, that healthful amusements and occupations should be provided for our phthisical patients.

And, gentlemen, when we shall have put in practice all the elements of the hygienic treatment of tuberculosis, it will not do to abandon the proper therapeutic management of this disease, and I cannot accept the dictum of Dettweiller that all medicaments are unnecessary. We should none the less treat the bronchitis of some, the diarrhœa of others, the gastric dilatation of this one, the insomnia and nervous agitation of that one; in a word, you will have still to meet all the uncomfort-

* Daremberg, "On the Hygienic Treatment of Tuberculosis" (*Bull. de Thèr.*, t. cxviii. p. 529).

† Nicaise, "On the Establishment of a Sanitarium for the Phthisical" (*Bulletin de Thérapeutique*, October 30, 1890).

able symptoms which may arise in the course of a disease so long and so distressing.

In the next lecture I shall take up the treatment of typhoid fever.

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*THE DETRIMENTAL EFFECTS OF OVER-EXERTION IN PULMONARY PHTHISIS.**

By Karl von Ruck, M.D.,† Asheville, N. C.

INASMUCH as no material benefit can be expected from direct medication in the treatment of pulmonary phthisis, and inasmuch as success must almost entirely depend upon management, which may be called a hygienic and prophylactic therapeutics, I have, in pursuance of the latter, endeavored to study as closely as possible to what extent it is really capable to influence the course of the disease. In so doing I have had the advantage of being able to give my entire attention to the treatment of phthisis for some years past, during which a large number of cases have come under my care, both in private practice and in my special institution.

By the close association with patients it has been possible to observe the conditions under which they appeared to improve and recover, and also the apparent causes which led to reverses and relapses, some of which I had formerly failed to appreciate to their full extent.

It is now my purpose to point out in this communication one of the causes which I have found to exert the greatest influence upon the course of the disease, not only as an obstacle to favorable progress, but frequently leading to reverses, not again recovered from. I refer to physical and mental over-exertions and the thereby induced heart-fatigue.

Having found my patients so uniformly inclined to carry these beyond the limits of benefit and safety, and having seen more or less serious injury to follow such indiscretion most constantly, I am fully convinced that, if this cause alone could be eliminated, the cases of improvement and recovery would be increased in number more than one hundred per cent.; and I ascribe the better results obtained in my institution, as compared with those in private practice, in no small measure to the control in this matter which I am there able to exercise.

The cause for these constant indiscretions on the part of phthisical patients is apparent, and depends upon the fact that the more intelligent understand very well how little they have really to hope from the administration of drugs for the cure of their disease; and that they place their only hope in the out-of-door life and exercise which has been recommended most urgently by their trusted medical adviser; and so anxiously do they cling to this only chance, that any attempted limitation, of one or the other, is looked upon by them as a doubtful measure and with apprehension. Certainly, so long as they are able to follow a contrary course, they are most unwilling to dispense, even only in part, with what is to restore to them their health. They can see no harm in taking in, as much as possible, of the air which will heal their lungs, by forced respiration, carried on purposely or produced by violent exercise, and the latter they feel sure will restore their former strength. This belief on the part of patients is, however, largely due to medical advice, in which out-of-door life is, as a rule, associated with exercise, without proper caution as to the latter; indeed, I know of eminent physicians having advised as much as possible of both, for patients who should at the time have kept their beds.

It is truly pitiful to see such patients literally drag themselves about, exhausting what little strength and recuperative power they may still possess; and more so yet, to see how, under the mistaken association of exercise with the necessary out-of-door life, their wasting becomes more evident from day to day, their steps less secure, their frames more stooping, their stopping "to catch breath" more frequent, and the hectic flush more distinct upon their sunken cheeks, until, finally, from utter exhaustion, or from resulting relapses and complications, they are obliged to keep to their house and room. But even here they resort to in-door gymnastics,—swinging dumb-bells or Indian clubs, or box against an imagined foe in the form of a suspended and inflated rubber air-bag or other contrivance calculated to offer resistance to their self-exhausting blows. Such sights are not uncommon in advanced cases, and the picture is only less painful in cases of the early stage, because there is still a relative appearance of well-being; but, so long as they tax their strength to the utmost in violent exertions, the advanced stage is reached surely and steadily, although the pace may appear less rapid.

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* Read before the meeting of the American Climatological Association, Denver, Col., September 25, 1890.

† Director Sanitarium for Diseases of Lungs and Throat, Asheville, N. C.

To illustrate the injurious consequences of over-exertion, I append notes from my case-books of a limited number of cases, some from my institution and others from private practice:

CASE I.—Gentleman; in early stage of pulmonary tuberculosis; had been free from fever for over five weeks, during which the pulse-rate had not been recorded above 88; he had gained eleven pounds in flesh, and his general condition, as well as the local state of his lungs, was highly satisfactory. He had thus arrived at a period where, by reason of consciousness of returning health, the tendency to over exertion is particularly manifest. Contrary to his general directions, he exceeded the amount of exercise allowed him by a walk of over six miles, and returned much fatigued. He had no appetite for his next meal, and the record for the evening shows: Temperature, 100°; pulse, 120; respiration, 28. It was a week before his previous condition was restored, with a loss of five pounds in weight, which it took him a month to regain.

CASE II.—A young lady; in more advanced stage of pulmonary tuberculosis; active symptoms had been absent for four months, during which there was no fever; pulse-rate, 80 to 96; respiration, 22 to 24; appetite good; slight cough, and scant expectoration early in the morning; bacilli were still present in sputum. Her body-weight had reached one hundred and thirty pounds, which was more than she had ever weighed. At this time she ascended a neighboring mountain, and returned hurriedly on account of some fright. She arrived completely tired out, panting for breath, and with a pulse which could hardly be counted,—about 140. Within an hour she expectorated several mouthfuls of clear blood; the pulse continued between 112 and 120 for several weeks. On the third day febrile symptoms, with loss of appetite, appeared. During the month she lost eleven pounds of flesh, and did not regain her previous condition until three months thereafter.

CASE III.—Married lady; tubercular phthisis; had just passed through stage of softening in right upper lobe, but was now improving in all her symptoms, being, however, still forbidden all active exercise, for which massage was substituted. Believing herself strong enough and desirous for a change, she walked down-stairs and upon the piazza, and returned to her room within half an hour, when her temperature had risen 2⅗° F., and the pulse-rate had increased 30 beats per minute, above any record for three weeks previous. She had no appetite for several days; lost two pounds of flesh that week, whereas the week previous she had shown a gain of three pounds.

CASE IV.—Same patient; about two months later had made much further improvement; fever was now practically absent; pulse, 100; respiration, 18; had been allowed short carriage-rides with apparent benefit. Limited to half an hour on the present occasion, she was out two and a half hours, and also stopped in town for some shopping. She returned so tired that she had to be carried to her room. Chill occurred twenty minutes later; high fever and loss of appetite set in. She relapsed in every way, and never again reached the improvement at which she had arrived before this last ride.

CASE V.—Gentleman; in advanced stage of tubercular phthisis, with large suppurating cavity in right upper lobe. History of repeated hemorrhages, and a severe one just recovered from before his arrival. He resided a week in my institution, during which he gained in flesh; fever and pulse-rate had become less with every day, and his appetite improved correspondingly. Desirous of getting cheaper accommodations, he went to a boarding-house about one mile distant, and returned several times thereafter for advice, always on foot, and each time his pulse rate was very rapid. In ten days he lost all he had gained, and he again returned to my house. Improvement occurred once more, so much that he believed himself much stronger in every way, and persisted in ascending the mountain in the rear, claiming that he enjoyed it and that it did not hurt him in the least. But upon every occasion I found his pulse-rate increased from 30 to 40 beats, and continuing so for a number of hours later. I was fearful of return of hemorrhage, which I held up to him as a likely occurrence, begging him to desist; but, although he promised, he took another trip without my knowledge. Returning, he died of a violent hemorrhage, a few minutes after he had reached the house, and although at his side almost instantly, there was no time to render him any material aid.

CASE VI.—Gentleman; tubercular phthisis; entire right lung involved, with circumscribed breaking down in upper lobe. A moderate-sized cavity developed in the course of a month, during which time he had to keep his room most of the time. Although

he had much fever and little appetite, he maintained his weight through this period. Improving thereafter rapidly, he was kept out of doors almost continuously, but his exercise was limited to repeated short walks upon the level grounds and to short carriage-rides. He soon began to extend his walks to distances of a mile or two, each time with slight return of fever and increase of cough and expectoration; and, as soon as he had recovered from one reverse, he was sure to produce another by his indomitable desire to take long walks, and no amount of remonstrance seemed to bring him to his senses, until I informed him that, unless he desisted, our relations as physician and patient would cease. At this time he had lost thirteen pounds of flesh, had regular evening fever, with a continuously rapid pulse and profuse expectoration. Henceforward we had no further trouble, and as by returning improvement he recognized his previous folly, he became not only a most exemplary patient, but grew actually timid, so that I had frequently occasion to urge him to increased physical exertion.

Case VII.—Young lady; in beginning of advanced stage of pulmonary tuberculosis, with a tendency to get into trouble if there was an opportunity ever so remote; had many slight relapses from mental and physical over-exertion, but, after many trials, permanent arrest, after a year's residence in my institution, was finally obtained. General health was good and local symptoms were absent, but her endurance seemed still to have a limit. As she was about to be discharged, I gave my consent to horseback exercise, for which she had long besieged me, this time rather to make a test, as she was sure to take it up on her return home. No harm resulted until she exceeded the limit of one hour, and stayed out all forenoon, in company with another patient, and, from what I learned, the ride was rather a wild chase than one for health. It resulted in immediate loss of appetite, sense of fatigue and malaise, and increased pulse-rate for several days, during which she lost several pounds of flesh; menstruation occurred a week in advance, and altogether it delayed her discharge for nearly a month.

Case VIII.—Young lady; in early stage of tubercular phthisis, without active symptoms for a month past; accompanied the patient whose imprudence I have just related. Being an inexperienced rider, she was limited to half an hour, and several such short rides taken previously had appeared beneficial. She was at this time gaining in every respect. She did not come off as easily as her companion. On her return she seemed utterly exhausted. Active symptoms occurred at once, which confined her to her room the greater part of the day for several weeks. Physical examination showed extension of the disease. She lost six pounds of flesh, but made up her relapse, during the month following, when she returned home for the summer.

Case IX.—Gentleman; with tubercular phthisis past the early stage; had resided in my institution several weeks, and had followed advice conscientiously and with benefit, as he was evidently improving. One morning he retired to his room after breakfast, and engaged in letter writing until noon, by which time he reached a temperature of 102° and a pulse-rate of 130; could not eat his dinner, and felt very tired all the rest of the day. Next morning he expectorated several bloody coagula, and it took a week before he felt as well as before, during which time he lost two pounds in flesh. The week before he relapsed his temperature had only once reached 100° F., and the highest pulse-rate recorded was 96; his appetite had been good, and his weight had increased two pounds. He told me on another occasion that he had not believed the letter-writing to be the cause of his relapse, and therefore tried it once more, and, excepting the bloody expectoration, with almost identical results; and I found in his case that, even a game of cards or prolonged, animated conversation, had a similar, although more transient, effect.

Case X.—(*From private practice.*)—Lady; with chronic pneumonia, in somewhat advanced stage. She believed in plenty of out-of-door life and exercise, and her house physician had so ordered. Under regular horseback exercise on every fine day (and we have on an average about twenty-five in each month), or long walks instead, she had lost twenty-two pounds of weight in the three months she had been in Asheville. Her temperature at the time she consulted me reached 103°, with a pulse of 120 to 130; cough, expectoration, and night-sweats kept her restless at night, and she was very much discouraged. By my advice she restricted her physical exercise to short walks and carriage-rides, and, beyond some treatment for nasal stenosis and pharyngeal catarrh, and the regulation of diet, no other change was made in the management of her

case. After a month she had gained eight pounds, her temperature and pulse-rate were much less, and she expressed herself as feeling better in every way. Three months later she returned home greatly improved, having made a gain of twenty-seven pounds in flesh from the time she came under my care, with disappearance of râles in the affected lung, and almost entire subsidence of cough and expectoration.

CASE XI.—(*From private practice.*)—Lady; with tubercular infiltration of right upper lobe and moderate deposit in left ary-epiglottic fold. She consulted me on account of growing constantly weaker and having much fever, and desired to know of a more suitable climate for her particular case. I found she lived in a boarding-house a mile out of the city, and to get proper exercise and keep up her strength she walked that distance once and often twice a day. I persuaded her to place herself under more favorable conditions, and she entered my institution soon thereafter, where her larynx received some attention, and her exercise and diet were properly regulated. Before she left Asheville—two months later—she had made remarkable improvement, which had begun immediately upon her admission. She could walk several miles without injury, had gained her former weight, was free of fever, and, as she expressed it, felt well enough to go home. Bacilli had been absent in the slight expectoration at the last two examinations made.

CASE XII.—(*From private practice.*).—Gentleman; with tubercular phthisis; entire right lung involved, with slight excavation in upper lobe. Called upon me on account of continuous loss of flesh and strength, and almost daily bloody expectoration. He had lost fourteen pounds in the six weeks since he had left home, had high temperatures and rapid pulse, frequently vomited his food on account of severe cough, and was very much discouraged. His physician had advised him to go to Asheville, let doctors alone, get on a horse and ride through the country if he wanted to save his life! He had followed this advice, and was unwilling to give it up, and although he now only rode three or four hours a day, he was worse after a month, during which he consulted me several times. He had lost six more pounds of flesh, and an acute pleurisy now laid him up and for the time stopped his folly. After partial recovery, he confessed himself willing and ready to do whatever I thought best for him, and he kept his word. Neither had we any further trouble. He improved thereafter steadily, and returned home with his cavity cicatrized, all râles had disappeared, he had gained nine pounds in flesh, cough and expectoration much improved, and without ever again having mounted a horse, but able to walk a mile or two without fatigue or injury.

I could now go on and relate many more such cases, more or less striking, but all showing the same relation of over-exertion to unfavorable progress. In my practice I am now most unwilling to abandon inquiry for this indiscretion, when relapse occurs that is not otherwise referable, and any physician who cares can make similar observations for himself. To do this requires, however, the careful keeping of records, of frequent observations of temperature, pulse-rate, respiration, cough, and expectoration, conditions of digestive organs, body-weight, etc., and also of the local findings of frequently-repeated physical examinations, but these data in private practice are seldom attainable on account of the amount of professional attendance required, which few practitioners are able to give and fewer patients would be able to appreciate.

I have frequently been asked why it is that over-exertion is so particularly harmful in the chronic affections of the respiratory organs, not only by patients, but also by professional friends, and physicians who were my patients, some of them maintaining that sufferers from other chronic diseases are not liable to reverses from similar causes. Less close observers, or such who had perhaps given the matter little attention, have even claimed this for phthisical patients also; and, indeed, the relation is not always so strikingly apparent as to invariably attract attention, especially in private practice, where we see our patients infrequently, and, as a rule, are only called or consulted after the relapse, and when our inquiry (if we make it) elicits only the patient's views in the matter. Frequently we concern ourselves most with the present condition and its relief. Especially in a busy practice, we are apt to pay less attention to inquiries into preventable causes than we really should. At any rate, I freely confess that, before I was interested in this work as I now am, I allowed myself to be satisfied with the explanation that the patient had taken cold, or with the supposed natural downward tendency of the disease, and it seems strange to me now that the great importance of this matter escaped my attention for so many years of my earlier practice. I

know now that relapses from taking cold occur infrequently, and that the supposed downward tendency does, in fact, exist in a diminutive fraction of cases only, in which the disease runs an unusually acute course; but that, on the contrary, there is a strong tendency to repair, improvement, and recovery in the great majority of chronic cases, even in such who are well advanced in the disease.

If phthisical patients are, however, more liable to reverses from over-exertion than others (and closer observation may show such liability to exist in sufferers from other affections also, and is known to exist in certain diseases of the circulatory organs), the accounting seems not difficult; for we find a good explanation in the effect upon the right side of the heart, and the lesser circulation, of any exercise which increases the heart's action and causes a greater demand for aerated blood by the tissues through the systemic circulation. In the presence of obstruction to a free blood-current through the lungs, by reason of impaired expansion, inflammatory and tubercular deposits, connective-tissue proliferation, cicatrization and retraction, accumulated secretions, and other causes for pressure upon the pulmonary vessels; the right heart and large venous channels become thereby overloaded, and lead to exhaustion, more or less permanent, of the heart-muscle, and to subsequent degenerative processes in the muscular fibres.

Even sudden dilatation is liable to occur, and I have witnessed such a case (now to me plainly referable to over-exertion) which proved rapidly fatal.

The non-resistance of lung-tissue to tubercular invasion and extension, if not produced, is certainly favored by nutritive disturbances due to anæmia, and the frequently-associated small and weak heart, and either is apt to be preceded as a primary cause, or attended as a result, by dyspepsia and other gastric complications. Thus a good circulation goes with good digestion, and *vice versa*. We all know how much more favorable the prognosis may be in a given case, where, other things being equal, we have a good heart with good digestion, as compared with one in which all our efforts to secure these advantages prove ineffectual; and we also know how we would avoid any medication or treatment which influences one or the other for the worse as scrupulously as we would maintain it, if it kept the heart and digestive functions at their best.

All my cases show that the heart's action is seriously affected, sometimes for weeks, by such over-exertion, and that with it the appetite is lost and loss of flesh occurs most regularly, and it is, therefore, not to be denied that with frequent repetition of this cause the downward course, formerly attributed to the natural tendency of the disease, is by right referable to mistaken self-management or want of control by the professional attendant in a great many cases, who make unnecessary shipwreck in their journey for health, both at home and at health resorts.

Furthermore, if Metchinkoff's observations continue to stand uncontradicted, and the leucocytes are primarily instrumental in the destruction and removal from the organism of the infecting bacilli, thereby limiting and preventing their extension to healthy tissue, we can see that in tubercular disease any hinderance to the circulation must of necessity diminish the number of the so-called phagocytes able to reach the affected part or the line of defence, which for the time being becomes less efficiently guarded, and allows of greater proliferation, activity, and extension of the germs, with the accompanying production of leucomaïnes and inflammatory reaction.

But let the explanation be whatever it may, clinically I have experience which to me admits of no more doubt that heart-fatigue is seriously detrimental to phthisical patients than I have of the known action of opium or chloroform, or of the relation of the bacillus of Koch to tubercular disease; and I only wish that I knew what more I could say or do, or that I might possess sufficient eloquence and power to convince, so as to impress upon the mind and conscience of every physician who advises and treats phthisical patients the great importance of its prevention. And I am equally convinced that if I so succeeded, I should have contributed more to the successful treatment of consumption than has been done by any advance made in this field of therapeutics for many a year past.

Error in the opposite direction is, however, also possible, although not fraught with a corresponding amount of danger; and I certainly do not wish to be understood as under-estimating the benefit of the rational employment of exercise in the management of phthisis, especially in conjunction with out-of-door life. I only protest against its abuse.

Nothing could be further from my mind

than to recommend absolute rest and inactivity, unless during the existence of high fever, acute processes, and certain complications. I believe exercise, short of amounting to fatigue, is highly beneficial to the best circulation, nutrition of tissues, and elimination of waste products, and the want of such to be justly looked upon as a predisposing factor in the acquirement of disease.

Whenever I am obliged to dispense with it, I substitute massage, the use of the faradic current, or both, and with much benefit. The mental faculties, too, require proper exercise, by light instructive study and literature, innocent and non-absorbing social games, conversation, enjoyment of natural scenery, music, etc., which are indispensable to the proper diversion of the patient's mind.

The amount of physical and mental exercise must, however, be carefully regulated for each patient, and must remain within the limits of safety at all times. The advice must not be given in a general way, but according to the circumstances of the case, the day, or even the hour. What one patient may do with benefit may prove harmful to another, and what is a proper amount of exercise at one time may lead to disaster under conditions of fever, the presence of complications, etc. It is always best to begin with a minimum, and to gradually test the patient's reaction by observations of pulse, temperature, appetite, and loss or gain in flesh; and the physician, in an institution, must have tact enough to do that for himself at opportune times. The patient is hardly ever to be burdened with the responsibility, and in private practice it requires the competent supervision of a nurse or attendant, without which we had, as a rule, better forego the information; for most patients become nervous and timid from such exact knowledge, and I can imagine no more miserable state of feelings and apprehension for the consumptive patient, especially when a physician works himself up too, who at all times and opportunities has his fever thermometer under his tongue and his finger upon his radial artery; and I have frequently been obliged to demand the surrender of the former and cessation of pulse-counting to make any progress at all.

Mr. President, I know that most, if not all, members of this Association share my views, and I present this communication not so much for instruction of the eminent men here assembled, but rather that by their public approval the profession at large may thereby be more ready and willing to take cognizance of a preventable and serious obstacle to the more successful management of a disease, the prevention and successful treatment of which is one of the chief objects of the labors of this Association.

ON THE TREATMENT OF RHEUMATIC FEVER WITH THE COMPOUND TINCTURE OF CINCHONA.

By C. C. P. Clark, M.D., Oswego, N. Y.

IN the days of our grandmothers, when, in their assiduous plying of their knitting-needles, it sometimes happened to them to "drop a stitch," they found it necessary, for the perfection of their work, to go back and pick it up. So, in the domain of therapeutics, when uncounted new remedies have been pouring in upon us and demanding our attention in increasing flood generation after generation, it could hardly fail sometimes to occur that the employment of a particular medicine, in some complaint, though once accepted as beneficent, should for a time, if not forever, fall out of sight and out of memory. This came near happening in the case of the employment of mercury in syphilis. Although that great light, John Hunter, more than a hundred years ago, anathematized the man who should dare to question its specific and nigh miraculous efficacy in that complaint, yet all through the first half of the present century the profession boggled and hesitated on the subject, and it is only very recently that that great therapeutic truth is fully established even among the regular faculty.

I have the vanity to think that I have fallen upon a somewhat similar instance in the matter of the treatment of acute inflammatory rheumatism, or, more properly speaking, rheumatic fever, by the use of the compound (Huxham's) tincture of cinchona. I mean not rheumatic affections at large, for I have little doubt that if the pathology of them were fully understood, the roster of ailments that are customarily classed under that one head would be almost as extensive as that of the diseases of the skin, and must require as various treatment. Certainly there is little or nothing in common between or among rheumatic fever, sciatica, articular, gonorrhœal, and synovial rheumatism, etc.

Ignorant as we still are of the etiology and deep pathology of the form of disease in question,—for I believe no one yet pretends

to have identified its specific microbe,—we are in general hardly less at sea with regard to its treatment. True, many pretended specifics in my own time have been brought to the attention of the profession,—"have had their day and ceased to be,"—the alkaline treatment, and the *quasi* acid, propylamine, and the salicylates. But, having faithfully and fully tried them all, I was still unable, at the period I am about to speak of, confidently to promise a patient attacked with inflammatory rheumatism any speedier cure than the "patience and flannel," or "six weeks" that we read about in writers of the day when bleeding, colchicum, and other physic constituted the armamentarium of the profession for this complaint.

While in this state of mind, I was called, about four years ago, to attend a rather delicate, though no way sickly, lad, of about 14 years, who had been getting sick for three or four days. I found a very severe case of rheumatic fever. Many of the joints were affected, with the usual almost daily change of site in one or more of them. To make matters worse, on my second or third visit I found marked cardiac symptoms.

Ordering the patient, as I always do in this complaint, to be enveloped in flannel, I put him at once on full doses of the salicylates, and for the heart inflammation applied a large fly-blister. Finding the sufferer not only getting no better, but constantly growing worse, I resorted on the third day to eliminative treatment by alkalies and sweating measures. It was at the end of the fifth day that, finding my patient evidently in a very perilous, as well as most distressing, condition, I chanced to recall, in my anxiety, that in the latter part of the last century some of the most trusted members of the profession were in the habit of employing, and strongly recommended in their writings, the compound tincture of bark in this complaint. The suggestion had the more weight with me because this had long been a favorite remedy of mine in several obscure and rebellious conditions of the system; and I directed the young man to take half an ounce of that medicine every four hours. The result was the most immediate and rapid amendment of every morbid symptom that I have ever had the pleasure to witness in this disease. It was so steady and continuous, and so much in contrast with the previous course of things, that I could have no hesitation in attributing it to the new remedy and to that alone. Within four days after its first administration every painful or threatening feature of his condition—heart symptoms and all—had disappeared, and only some weakness, emaciation, and stiffness remained. The man was cured, if ever a man was.

My next case was substantially identical with this, except in the absence of any sign of cardiac trouble, the subject being some ten or a dozen years older, and always before this attack in the enjoyment of good health. He had been for some days under the care of another practitioner, who had treated him according to the best current lights of the day. In spite of which, however, he was hardly able to stir a finger, much less any larger member, when I first visited him, while the sick-room would be blue with his execrations at the least jar of his bed. I treated him in the same way—the story need not be long—and with identical result.

My next case was in the person of the mother of the first. It was, however, much milder than either of the two already mentioned, but, like them, had the characteristics of a general fever. It was treated in the same way and with the same happy effect.

These instances so established in my mind the efficacy of this remedy that from that time to this—during which period I must have treated at least a dozen cases—I have used absolutely no other treatment in acute inflammatory rheumatism, except sometimes an opiate to relieve pain, flannel next the skin, and perchance a blister over the region of the heart, and never have failed of substantially curing my patient within a week at the utmost, and usually in half that time.

It should be added that the neighborhood where I practise is remarkably free from malaria. I have not seen a case of typical intermittent fever for a dozen years.

I should also add that I have not found the remedy here recommended of value in any of the various forms of chronic rheumatism, such as those attended with muscular atrophy or contraction, or in sciatica or any of the other kinds of so-called local rheumatism, but only in that general or constitutional ailment, which, like other fevers and many local inflammations, has at least a strong tendency to a self-limitation, whether of "six weeks" or of some other period. Even here it may be that phenacetin, which seems to possess properties much resembling those of cinchona, and is of late so highly recommended, but which I have had no occasion to experiment with in the complaint in question, will prove as serviceable as Huxham's tincture.

THE DIETETIC TREATMENT OF EPILEPSY.

By John Ferguson, M.A., M.D., S.R.C.P., L.F.P.S.,* Toronto, Canada.

IN the remarks I am about to make, I wish to be understood as limiting my statements to those cases of epilepsy known as true, idiopathic, or genuine. In these cases we have a convulsive seizure that is universally representing in its character. In other words, we have a form of convulsive movement that involves the highest centres. From this the explosion overshadows lower centres, and sets up a very wide and comprehensive disturbance. That the highest centres are involved is seen by the loss of consciousness in true epilepsy; and the abnormal mental state that follows, though this may be very brief. There is also a certain degree of paralysis, consequent upon the discharge of these nerve-centres and the resulting exhaustion.

Just as certain as an epileptic seizure arises in the highest centres, so sure is its course that of an excessive liberation of nervous energy. Ordinary discharge of nerve-energy gives rise to our normal movements. "When this passes into extravagance we exhibit abnormal movements. This liberation of nervous energy is a sudden setting free of stored energy. That this may take place under ordinary conditions of every-day life there must be some unstable state of the matter forming these highest centres. By some means the cellular matter of these centres becomes overloaded with energy, they become unstable, are in a ready condition to part with this energy. This is not all. The discharge is sudden and excessive. When these centres discharge, they not only do so to the extent needed for usual movements, but to the extent that shall produce unusual movements, and be followed by exhaustion, so that the person lies comatose and paralyzed.

It is now a well-known law that all the nitrogen compounds are particularly likely to be unstable, and of a very explosive nature. The brain-substance contains much nitrogen, and as such tends to be an unsteady compound. Can the brain at certain times contain more nitrogen than is normally present? My own belief is that it may; that there may be such an atomic rearrangement, so as to produce molecules with too much nitrogen. I cannot give any chemical proof for this opinion. It rests entirely upon clinical evidence. The fact, however, is known to all that, from time to time, the brain assumes that status which causes a nerve-explosion, while, at other times, these same centres are quiet, or reduced to the normal condition of stability, or subexcitability. There must have been some important change induced by the discharge, and this change is in the direction of reducing the highest nerve-centres to a more stable condition for a time, to a condition where I believe the molecules are so arranged as to contain less nitrogen. There are different proteids, and these contain different proportions of nitrogen. Now, as these may vary in the brain, we may easily pass from a condition of stability to one of great instability; in other words, to an epileptic brain.

Certain drugs act upon the nervous centres so as to control to some extent this tendency to discharge. How is this done? The answer is twofold. First, these drugs may act so as to fix the nitrogen compounds, and render them more stable, less likely to part within nitrogen, less ready to discharge. Second, these drugs may act by preventing the formation of these unstable nitrogen compounds. This, I believe, is the real explanation. Under the use of the bromides the molecules take in nitrogen less rapidly, and consequently do not become so unstable or explosive.

If this is the case, can anything be done towards the reduction of the share of nitrogen by feeding the patient after some fixed plan? To this I answer, yes. Take young dogs and cats, and feed them too freely upon meat, and you can make them—especially the dogs—very subject to fits, similar to ordinary epilepsy in the human subject. Acting on this line, I have been in the habit of making my epileptics become strict vegetarians. Eggs, lean meat, red fish flesh, cheese, peas, beans, and all nitrogenous articles are cast off. The amount of nitrogen entering the system is reduced by this means to the lowest possible quantity. Under this dietary it is much more difficult for the nervous system to build up those unstable molecules, full of nitrogen, ever ready to fall into new combinations, and produce discharge of energy, while these changes are being effected. By persistently reducing the daily consumption of nitrogen there is not such a free formation of the catabolic molecules, the discharge of which is necessary for the production of the

* Demonstrator of Anatomy, Medical Faculty, University of Toronto; and Lecturer on Nervous Diseases, Summer Session.

convulsive seizures of true epilepsy. This method of treating these patients has been of very great value in my hands. It would seem, however, that the restitution of the diet to an almost non-nitrogenous vegetable one is of most use in those extremely catabolic conditions met with in the status epilepticus. It is in this variety of the disease that we have such poor results from the administration of drugs. I have treated some epileptics on the above food plan and without drugs, the health being better than when taking the bromides, without the restitution in diet. I would not go the length of saying that epilepsy is a food diathesis, yet I am strongly inclined to think that it tends this way. Not all those who use meats and liquors to excess become gouty; nevertheless we do not doubt that gout is a food diathesis thus produced.

With our epileptics there is an extremely unstable condition of the nervous molecules. This unstable state can be greatly lessened by lessening such food-supply of the molecules, as that from which the excess of nitrogen is obtained.

Whether the above is a true explanation or not of the action of a non-nitrogenous diet, it is at all events some explanation. We shall all await the reports of chemists on the minute and, perhaps, varying composition of the brain. I am strongly of the opinion that a good deal of the work that shall be done in the near future shall be along the line of this higher chemistry. The clinical facts remain, whether the explanation stands or falls. Patients that have been greatly afflicted with epilepsy, and have become wearied with much taking of drugs, have derived a very great deal of good from being restricted to a diet containing the least amount of nitrogen consistent with life, and that, too, almost exclusively of a vegetable kind.

ON THE USE OF NITROGENIZED FOOD IN FEVER AND WASTING DISEASES, ESPECIALLY IN THE FORM OF PEPTONIZED BEEF-POWDER (MOSQUERA BEEF-MEAL).

By Frank Woodbury, A.M., M.D.,*
Philadelphia, Pa.

NITROGEN, as aptly remarked by the late Dr. J. Milner Fothergill, is the characteristic element in most explosive and force-generating compounds from gunpowder to nerve-substance. It certainly is the essential chemical component in the class of foods which is universally recognized by physiologists as the special suppliers of energy to the human frame. But this class of alimentary substances (commonly known as *proteids*, on account of their high rank among nutritive agents, or *albuminoids*, because albumen is taken as the type of the class) has a more important mission than that of merely supplying material for metabolism possessed of a high coefficient of energy; they are pre-eminently the tissue-building and tissue-restoring foods. They supply the elements which by the living cell are appropriated and converted into bioplasm, thus affording the means of generating new cells and cell-products and of replacing effete structures. They are so essential to growth and development that the name of "plastic aliments" was given to this class by Baron Liebig, the pioneer among physiological chemists of this century.

From the earliest times to which medical records can be traced, clinical observation and experience have sanctioned the use of animal food—in the form especially of broth (jusculum or pulmentum)—as a restorative in wasting disease and during illness or prostration from any cause, where it was considered desirable to introduce nourishment in a form easy of assimilation and capable of promptly invigorating the bodily powers. The flesh of various domestic animals has been used for this purpose, though probably beef, being the most convenient, was the most frequently employed.

In fact, beef-infusion, bouillon, or beef-tea, as it is popularly termed, a generation ago was regarded with such extravagant esteem that it threatened to become a fetich. As soon as sickness was announced in the house, the good-wife would, of her own accord, proceed to administer potions of this rather insipid beverage to the invalid, as a sort of formal notice to the family that he was on the sick-list; perhaps also with a vague hope, by the sacrifice of a libation, of propitiating the lares and penates, so as to bring about in some mysterious way his early restoration to health. This practice generally received the full approval of the attending physician when he was called in. Possibly his knowledge of dietetics in disease did not extend much beyond a favorite formula for making the beef-essence or beef-tea, which he delivered with such magistral air that it is not surprising that its details were received with reverent, almost superstitious, attention and scrupu-

* Fellow of the College of Physicians of Philadelphia; Honorary Professor of Clinical Medicine in the Medico-Chirurgical College, etc.

lously obeyed, while the weightier matters of sanitary law were too often sadly neglected. Although this practice in some families still survives, there are at the present day few physicians of any standing in the profession who cling to the traditional beef-tea, or regard it as possessing much actual food-value. The iconoclast and scoffer have done their work. Both chemist and clinician now assert that the meat-infusion, as ordinarily made, by boiling, contains only some of the salts of the meat, flavored with osmazome, the albumen, rendered insoluble by heat, being precipitated and left behind in the strainer. In other words, beef-tea, thus prepared, represents a very small percentage of the actual nutritive material contained in the meat. Fothergill contemptuously declared that in chemical composition it resembles urine, and implied that it did not possess much more value as food. Its only recognized worth was thought to be its slight stimulating effects upon the stomach and circulation. Moreover, Lauder Brunton claims that, even when carefully made at a lower temperature, so as to retain some peptones, it is really injurious when taken in large quantities. He raises the question whether "the products of muscular waste, which constitute the chief portion of beef-tea or beef-essence, may not, under certain circumstances, be actually poisonous?"* His fear of peptone poisoning was apparently based upon the results of experiments made by Albertoni and by Schmidt-Mühlheim, which demonstrated a fall of blood-pressure, stupor, and fatal convulsions, following the introduction of peptones into the veins of dogs. In a case, reported by Brunton, of a man who had drunk a large quantity of beef-tea at a draught upon an empty stomach, peptones were found in the urine, thus demonstrating their passage through the blood unchanged. In this case the serious results predicted apparently did not occur, or they would have been recorded as being of more interest than the mere existence of peptonuria. It is not improbable that the untoward results in the laboratory experiments might be attributable to other causes. They might, for instance, be due to accidental contamination with ptomaïnes, which are prone to appear in peptone-preparations after standing awhile, owing to the almost inevitable presence of micro-organisms, which in them find a most favorable culture medium. (Here we have a hint not to keep broth standing exposed to the air, but to make small quantities at a time and use while fresh.) Some such explanation must be true, since no one has seen similar serious results following the administration of well-made broths, even when comparatively large quantities have been taken, as in the case just cited. Brunton, it is true, speaks of the possibility of bad results, and believes that he has seen some ill effects, but his large experience appears to offer no actual instance of abnormity more marked than the case of peptonuria mentioned.

There was an old notion, which requires a brief consideration, that in the treatment of fevers, or diseases attended by fever, animal food was especially injurious, although it was known that in this state the nitrogen excretion is largely increased. Huppert and Riesell, some twenty years ago, in their researches into nitrogenous metabolism, apparently afforded the first scientific basis for this belief. They assumed that their experiments conclusively established the fact that, after the free administration of albuminoids to febrile subjects, more nitrogenous products of metabolism were excreted by the urine than with a diet poor in albumen. Following these authorities, many believed and taught that "in fevers not only can no nitrogenous equilibrium be established by any supply of nitrogenized food, but that the withdrawal of albuminoids from the body and the disintegration of its structure are still more accelerated."† Many clinicians, however, refused to accept this dictum, which was destined to be soon overthrown by the experiments of Immermann, whose results were confirmed subsequently by Bauer and Kunstle. The last-named investigators examined the question from the clinical stand-point in a typhoid fever patient, whose food and excreta were daily analyzed, and the amount of nitrogen in each carefully determined and recorded. Without dwelling upon the details, they conclude that it may now be accepted as proven that "by the supply of albuminous food to a fever patient a saving of albumen in the body may be effected; for, though the excretion of nitrogen is increased, the loss of the same element from the body is reduced." In other words, the nitrogen excretion does not increase proportionately with the increased supply in the food. At the same time, "it should be observed that the diet did not consist of

* "On Disorders of Digestion," London, 1886, p. 247.

† "On the Dietary of the Sick and on Dietetic Methods of Treatment," Professor Bauer; Ziemssen's "Hand-Book of Treatment," New York, 1885, p. 208.

pure albuminates, but of mixed food, rich in nitrogen, though containing also fat and carbohydrates as well as albumen."*

In many acute disorders, where the course of the disease is brief, the patient may have sufficient nourishment stored up in his tissues to support life until convalescence occurs, so that, in such cases, a low diet will suffice, and food becomes of secondary importance. On the contrary, in prolonged cases of disease, especially where the patient is weak and not well-nourished, a regular supply of easily-assimilated food becomes of paramount importance. From physiological laws, to which brief reference has been made at the beginning of this paper, nitrogenized aliment is necessary in order to supply the elements needed for the building up of tissues; and this is especially the case when there has been increased metabolism and destruction of albuminates, the result of increased temperature. Starchy foods fail to supply the plastic principles required to restore the tissues to their normal condition.

The principal articles for the sick which contain nitrogen are meat, eggs, and milk, or casein or albumen in some form or other. From these, various nutritious articles of food are made, such as milk-punch, egg and milk, broths, and various combinations, such as consommé with egg, custards, meat-juice with milk, etc. In order to make the casein more acceptable to delicate stomachs and weak digestive organs, milk may be partly peptonized, by the use of digestive ferments, before administration; if fully peptonized, the taste of the milk becomes disagreeable and bitter. By this method, the question of nutrition in some trying cases has been much simplified, and the results have been more successful than any hitherto obtained. In the same way, meat may be partially digested, and beef-tea, made by the cold method, does, in fact, contain a considerable proportion of peptones, and is made correspondingly more nourishing and valuable.

A new and very promising food-product has just been brought to this country. It is in the form of a fine meal, made of desiccated beef, prepared in a novel manner. Some years ago Débove, of Paris, called the attention of the profession to the usefulness of powdered beef in his method of forced feeding (gavage), and described a process for preparing it. Various forms of powdered meats have been brought forward at different times, but they failed in nutritive value, as they largely consisted of insoluble matters. The beef-meal of the Mosquera-Julia Food Company of Venezuela, however, is manufactured on a new principle; its projectors have solved the problem finally by treating fresh, lean beef with a digestive agent before desiccating it.

A word may here be said with regard to the method of making the beef-meal and the agent used in partially peptonizing the meat. It was about ten years ago that Professor Wurtz, of Paris, isolated from the juice of the *Carica papaya*, or papaw-plant, a principle resembling pepsin in its action upon albuminoids, converting them into soluble albumoses and peptones. This substance, which he named "papain," is now comparatively well known, and it has been used for cases of weak digestion, and also for its softening effect upon the false membranes, as a local application in diphtheria. It has recently been discovered that this valuable property of digesting meat and of converting albumen into peptones is not peculiar to the papaw, but is exhibited also by some other plants. It is especially manifested by the pine-apple and allied plants of the Bromeliaceæ.

In the preparation of the Mosquera-Julia beef-meal the juice of the pine-apple plant is utilized with very excellent effect. The advantages of employing a vegetable digestive principle rather than animal pepsin (and especially the usual kind of pepsin) are very obvious: the superiority of the former over the latter needs no discussion from either an æsthetic or antiseptic point of view. It is a matter of considerable importance that the ferments of vegetable origin are entirely free from the forms of pathogenic bacteria, which are liable to be found contaminating animal pepsin and pancreatin.

The Mosquera-Julia beef-meal, therefore, differs essentially in its mode of preparation from all other powdered meats, and the resulting product is correspondingly superior. Other powdered meats consist largely of indigestible fibre, and have a disagreeable odor and taste; this, on the contrary, is largely soluble and is odorless, and has a pleasant taste; it is entirely free from the bitterness that generally attends preparations made with digestive ferments of animal origin. It represents all the constituents of fresh meat in highly-concentrated form, predigested with pine-apple juice, as previously stated.

Containing, as it does, less than ten per cent. of water, it will be seen that Mosquera's

* Bauer, *loc. cit.*

beef-meal, with the exception of this small percentage, is composed of nutritive matter, nearly half of which is in a readily soluble form; the other half easily convertible into soluble products by the digestive juices, as may be determined by testing samples of the insoluble matter with solutions of pepsin and hydrochloric acid, and with alkaline solutions of trypsin.

Lean beef, according to Dr. Letheby, has the following composition:

	Per cent.
Nitrogenous or albuminoid matter	19.3
Fat	3.6
Saline matters	5.0
Water	72 0

From these figures it is evident that Mosquera's beef-meal, having been freed from water, contains about four times the amount of albuminoid matter present in average lean beef; but the real difference in nutritive value must be considerably greater than this, since one-half of the proteid matter of the beef-meal is in a readily assimilable form, and, furthermore, the preparation contains about three times as much fat. Another notable feature in this preparation, which distinguished it from other predigested albuminous foods, is the absence of all objectionable taste and smell. The bitter, or other disagreeable taste of ordinary peptone preparations, is, as before stated, wholly wanting in this product. This is a very important point, since by its aid a highly nourishing broth can be made at a moment's notice, which can be taken with relish by the sick or the well.

Without dwelling upon individual cases, I would state that I have found the beef-meal especially serviceable in relieving prostration and the effects of fatigue, in elderly persons, in the form of the broth just mentioned, and nicely seasoned. Also, in the intestinal disorders of the aged, it serves to support life and sustain strength, without taxing the digestive functions, already enfeebled by disease and physiological decay. In cases of pulmonary phthisis I have seen good results in keeping up the vital powers and in aiding the struggle against the deadly progress of the disease. I would especially mention the use of the broth, seasoned with pepper or capsicum, in cases of alcoholic excess, drink-craving, and delirium tremens. Here the stomach rejects ordinary food, but does not rebel against the hot broth, in moderate quantities, repeated at short intervals. In all cases of fever, where beef-tea was formerly employed, the strength of the patient can be maintained much better with such an easily-assimilated preparation as this. As insisted upon by Graves, the delirium and other nervous symptoms of fever are often due to weakness caused by want of nourishment; in truth, he states, in one of his clinical lectures, that he had seen many fever patients starved to death. This is not the practice at present. Since Graves's time we have learned to feed fevers, and the change, which is largely the result of his teachings, has been very much in favor of patients. The chief problem of how to obtain animal food in easily-assimilated form seems at last to have been solved. Moreover, by the judicious use of broths made with Mosquera's beef-meal, it will be found that the necessity for a resort to alcoholic liquors is of rarer occurrence, owing to the absence of the so-called indications for stimulants.

In cases of infantile prostration or debility, following bowel disorder, it becomes necessary very often to stop the administration of milk and substitute some other form of nourishment. In such an emergency the strength of the little patient can be supported by mixing beef-meal with rice-water or albumen-water, and the patient kept upon this exclusively, for days at a time. Many cases of rickets are due to insufficient nourishment in early life. The mother's milk may not be sufficient in quantity or of good quality, or the artificial food may be given too much diluted. In such cases good immediate results may be obtained, and future difficulties averted, by a more generous diet, and especially by an easily-assimilated nitrogen-containing aliment, such as beef-meal. Of course, there are other ways of administering this valuable nutriment than those I have mentioned, which will suggest themselves to the mind. It may be dusted on bread, a little sandwich made with it, or it may be mixed with almost any other article of food, such as coffee or chocolate, of which children usually are very fond. Finally, it would form a highly useful addition to nutritive enemata in cases where feeding by the rectum is deemed advisable; it may also be introduced, as in the method followed by Débove, by gavage, using a stomach-pump or soft rubber tube.

If the beef-meal is kept up to the present standard of quality, and by more extended experience is found to fully accomplish all that this preliminary note appears to warrant us in expecting from it, I believe that the terms used in this communication will be found to come short of its actual value in the sick-room. I can only say that while

under trial in hospital and private practice for some months it has proved in my hands highly satisfactory, and has entirely superseded the old forms of beef-tea and broth in cases in which they were formerly considered indispensable.

218 South Sixteenth Street, Philadelphia.

ACUTE PLEURISY AND ACUTE RHEUMATISM.

In 1883 Aufrecht drew attention to the decided results he had obtained in the treatment of acute pleurisy with the salicylates. Recent writers, notably Tetz (in the *Therapeutische Monatshefte*, No. 7, 1890), have confirmed his observations. We must allow that the title of a remedy to cure acute pleurisy must be very well substantiated. Acute pleurisies have a way of stopping short without treatment, of beginning with a fierce pain which suddenly abates, and of suddenly going on into the stage of extensive effusion with very little warning pain at all. Nevertheless, the successful results of the administration of salicylates in acute pleurisy, as recorded by these writers, are sufficient to raise in our minds the question as to whether acute rheumatism and acute pleurisy are not the same disease. Long ago Mr. Hilton, in his admirable lectures on "Rest and Pain," pointed out the resemblance between the pleura and pericardium and the joints. The pleural cavity represents a huge joint constantly in motion. It has the two surfaces covered by serous membrane and gliding smoothly upon each other by the aid of a lubricating fluid. And Mr. Hilton went on to apply his law of associated muscular action, nerve-supply, and function to the pleura, showing how, when inflammation took place, the nerves of the pleura that were directly in communication with those supplying the intercostal muscles called for cessation of movement, and how the pain felt in the skin over the inflamed area was the agent by which this needed rest was obtained. Practically the same thing occurs in the joint that is inflamed and painful from acute rheumatism. Probably the resemblance between inflammation of a serous membrane and that of a joint would be more striking were the conditions exactly similar. But in the case of the serous membrane complete rest of the opposed surfaces cannot be obtained. The lungs cannot cease taking in air, and the heart cannot stop beating. Probably this accounts for the more fibrinous and adhesive character of the effusion, a further effort of nature to secure rest. In the case of the joint immediate rest is secured, and the effusion is not adhesive in ordinary cases.

The clinical features of acute rheumatism point to a common origin with pleurisy, if not to a practical identity. Many cases of acute articular rheumatism are complicated with effusion into the serous membranes. We say *complicated*, but we mean really that the pleural joint or the pericardial joint has been attacked as well as the wrist-joint or the elbow-joint. And pleural effusions are of much more frequent occurrence in the course of rheumatism than is commonly supposed. In the ordinary run of cases of acute rheumatism, the joints are so very painful that an examination of the bases of the lungs is not quite practicable, and, moreover, there are many practitioners who do not injure themselves with overzeal in the clinical examination of patients, particularly after a good working diagnosis has once been made out. We are satisfied that, if pleural effusions in rheumatism were more frequently looked for, they would be oftener found, and those who found them would be more disposed to regard rheumatism as a general attack on all the joints, including the serous membranes.

The general tendency to look with suspicion upon "exposure to cold" as a cause for so many diseases, to regard chilliness as an effect consequent upon the poisoning of the system by some external agent, rather than as a cause of disease, makes us sceptical as to whether such a thing as *pleuritis a frigore* exists. Is it not more rational to regard it as being due to some inherent tendency in the individual to inflammation of an arthritic form, and to infer that, when pleurisy occurs alone, it simply means that only one joint is affected, or perhaps that the main attack has been upon one joint, the others escaping lightly? The frequent occurrence of pleurisy without effusion into other joint cavities might arise from the fact that into the pleura a quantity of fluid may be effused rapidly, while when the joints are the main points of attack but little can make its way into them. To borrow an old expression, the *materies morbi* readily leaves the blood to fill up the pleural cavity, but, attempting to pour itself into a joint, it meets with resistance and seeks an outlet elsewhere. The effect of the salicylates, so well marked in rheumatism, ought to be equally good in this disease, and we trust that many observations will be made in this interesting subject.—*New York Medical Journal*, November 1, 1890.

The Therapeutic Gazette

EDITED BY
ROBERT MEADE SMITH, A.M., M.D.,
Professor of Comparative Physiology, University of Pennsylvania,
PHILADELPHIA.

GEO. S. DAVIS,
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Leading Articles.

ETIOLOGICAL THERAPEUTICS.

TO remove the cause is the first principle in therapeutics. But, unhappily, this indication is not always easy of fulfilment; hence the various empirical methods of treatment in vogue which assume the cause to be unknown; hence the necessity oftentimes of resting contented with symptomatic therapeutics.

1. There exists a whole category of diseases, of which the causal agent is still obscure (*e.g.*, gout, rheumatism, herpetism, carcinoma, etc.), where the best that can be done is to meet symptoms as they may arise, and, as far as possible, bring back deranged physiological processes to the normal.

2. There are other diseases the causes of which are multiple or complex. It is very probable that some or all of the morbid conditions mentioned in the preceding paragraph may belong to this category. Take, for instance, a case like the following: A man is an earnest student, and in his devotion to his books he denies himself the needed sleep. Moreover, he is addicted to certain vices,—to the tobacco habit, to alcoholism, or to gluttony. Nervous prostration and morbid states of the heart, kidneys, stomach ensue. Eventually he becomes a victim of phthisis.

As an instance of complexity of causation, we will suppose a case of epilepsy, due (as far as the probable antecedents can be traced) to nervous instability, inherited from both lines of the patient's ancestry, and aggravated by bad hygiene and personal vices of his own. In such cases the difficulty of instituting any satisfactory treatment based on etiological considerations is apparent.

3. There are diseases of which the cause may be known, but the effects are more or less persistent, though the cause is no longer operative. Such are the catarrhal affections produced by cold. It may be that in these cases it will ere long be admitted by all (as it is now affirmed by many) that the cold—the chilling of the body—is only a predisposing cause, by the depression of vitality which it produces rendering certain vulnerable textures a fit soil for the habitation and pullulation of pathogenic microbes (as the microbes of suppuration). However this may be, the effects may long remain.

Another instance is seen in the pathological sequences of certain poisons,—alcohol, tobacco, mercury, opium, lead, phosphorus, arsenic, etc. The injuries to the principal vital organs caused by these agents is often irremediable.

4. The cause may be known and the effects may be removable, on the principle—"*Sublata causa*, etc." The inebriate may not have gone so far in his downward career but that with entire reformation *restitutio ad integrum* may take place. The same may be said of the morphine *habitué*.

The victim of puerperal septicæmia may often be saved if by rigid antiseptic precautions all further introduction of bacterial infection is prevented.

It is by intelligent therapeutic intervention in morbid conditions that come under this category that the physician finds his largest sphere of usefulness, and his principal satisfaction in the pursuit of his humane calling. The opprobrium of medicine has ever been that it could neither reach the cause nor remove the effects, while the surgeon, by attaining both these ends in the exercise of his art, not seldom finds occasion to magnify his office above that of the general practitioner.

Under the head of "exciting causes" of disease which are "cognizable," we have such as are mechanical, which injure structure or

impede or derange function; we may instance tight stays, a stone in the bladder, a gall-stone, a renal calculus, tumors, etc.; the ingesta are a frequent source of disease, and the same may be said of excessive bodily or mental exertion, excessive evacuations, suppressed or defective evacuations, defective ventilation, cleanliness, and drainage. By careful attention to the removal of these causes, the physician and surgeon may often show themselves adepts in etiological therapeutics.

The old text-books on pathology spoke of certain "non-cognizable" agents,—*i.e.*, the endemic, epidemic, and infectious poisons. Modern pathology is no longer content with this classification, or with the admission that these infectious agents are unknowable. Nor do the terms *virus, poison, miasm* now satisfy the exact demands of a more enlightened pathogenic nomenclature; we are looking for the specific microbes and the "ptomaïnes" which they generate as the explanation of all the infectious diseases. It is true that but few of these have yet been discovered, and many still remain "unrecognizable," but the progress which has been made warrants the expectation that ultimately the living agents of all the communicable diseases will be known. It cannot but be that advance in therapeutics is destined to be along this line of etiology. As fast as the agents of infection become recognized there will be the irresistible tendency to antagonize and destroy them; at any rate, prophylaxis has won signal triumphs in this direction already.

If Koch's discovery, which has of late been heralded across the water, of the method of treating phthisis by the use of his vaccine lymph, should prove to be what is claimed for it, we may be on the eve of a revolution in medicine in the line of etiological therapeutics, but we must await with soberness the results attending further experimentation with this method.

ANTIMONIALS.

ALTHOUGH the statistics of Lasègue and Regnauld (1855–1877), completed by Bourgoni and Beurmann down to near the present time, show that in the Paris hospitals, as indicated by the books of the Pharmacie Centrale, the use of antimonials in medicine does not seem to have sustained much variation for the last thirty years, and although we have no equally good statistics to tell whether the consumption of antimonials in this country and in England is on the wane or remains about the same, yet, if we may trust the statements of representative practitioners and pharmacists, there has latterly been a great falling off in the employment of these medicinal agents. As for the disciples of Rasori, who taught the doctrine of excessive stimulus in acute diseases, they are all dead, and no one now gives antimonials in the enormous doses which he recommended in order to have a contra-stimulant action, and jugulate or restrain an inflammation. An enormous advance has been made in the knowledge of pathological processes and the actions of medicines since Rasori enunciated his theory early in this century. Between the doctrines promulgated by Rasori and his opponent Brown, no one doubts that Brown was more nearly right in insisting on the factor of debility or asthenia, as essentially characterizing all acute disease. With the prevalence of the microbial doctrines, there is more and more tendency, not only to ascribe to microbes a causal agency or prominent part in all inflammatory and febrile diseases, but also to emphasize the predisposing debilitating conditions which render the fluids and solids of the organism a fit culture medium for the development and depredations of the virulent micro-organisms. Therefore the idea seems nonsense to most practitioners that the liberal administration to the sick man of one of the most depressing medicaments of the materia medica is likely to give him an advantage in the life-and-death struggle with the microbe foe. Hence it is that, even in pneumonia, less and less tartar emetic is now exhibited. Formerly it was the routine practice to treat this disease from the first with nauseating doses of this antimonial; at the present time few properly-instructed medical men make much account of this medicament in the therapeutics of pneumonia; in fact, the average physician fights shy of it altogether. Statistics have proved again and again that pneumonia does not do better with tartar emetic than without it, and, at the most, only certain symptoms, as dyspnœa, may be favorably modified by the administration of small doses of the antimonial. In fact, the microbial theory of pneumonia is coming more and more to the front, and the fact is recognized that the predominant indication—in the absence, as yet, of any known parasiticide medication—is to sustain the vital forces in their struggle with the bacterial enemy.

So it might be said of other acute inflammatory affections for which antimony was formerly freely given. It is true that the notion is still widely held that in inflammations with active determination of blood, tartrate of antimony, in suitable doses, may so enfeeble the action of the heart and so lessen arterial tension as to diminish the afflux of blood to the inflamed part, and thus limit exudation and perhaps apoplectic extravasations. That there are now and then inflammatory attacks in phthisical individuals, where the judicious administration of antimony is demanded, we would not deny, but even in such cases many practitioners prefer depressants like veratrum viride, which are relatively safer. It is easy to carry too far, especially in infirm and aged patients, and, in cases of fatty myocardium, the known *cardiac depressant* effects of antimony; indeed, all authorities admit that children and the weak and aged are poor subjects for the exhibition of this remedial agent.

The utility of antimony in the production of diaphoresis in occasional febrile affections of ephemeral character is unquestioned; at the same time, it is easy to find other drugs which produce the same effect with less nausea and prostration.

The relaxing effects of tartar emetic on the muscular system made it once much employed for the reduction of herniæ and dislocations; at the present day, the superiority of chloroform and ether, pushed to full anæsthesia, in the production of muscular relaxation is everywhere recognized.

The specific influence of tartar emetic on the secreting organs, and especially on the respiratory mucous membrane, has made this remedial agent useful in laryngitis and bronchitis, with absence of secretion, and more or less of dyspnœa. Even here, especially in the therapeutics of childhood, ipecac may generally be substituted for the antimonial, and the effects will be equally good. If antimony be given at all in infantile therapeutics, it had better be given in the way that Ringer suggests: Dissolve one grain in a pint of water, and give in teaspoonful doses. He would give this dose every half hour, till relief is obtained, to a child from 6 to 12 years of age, where there is much bronchitis, with sibilant râles and dyspnœa. It is doubtful whether any advantage is gained by continuing the antimonial in any dose whatever after secretion is established.

There is no call for the administration of tartar emetic in pseudo-membranous laryngitis, while in the spasmodic form "no medicine," says Stillé, "is more certainly or promptly effectual in arresting the progress of this distressing but seldom dangerous disease than antimonial emetics." It is needless to say that in this false croup other practitioners (*vide* Niemeyer, Steffen, Brunton, Dujardin-Beaumetz) place more reliance on anodynes and antispasmodics, such as musk, assafœtida, bromide of potassium, castor, and chloral.

THE PHYSIOLOGICAL ACTION OF THE BROMIDE OF RUBIDIUM AND AMMONIUM.

IN the THERAPEUTIC GAZETTE for October 15, 1889, and January 15, 1890, we published accounts of the studies made by Professor Laufenlauer and Dr. Rottenbiller as to the results which followed the administration of the double bromide of rubidium and ammonium in epilepsy. These results appear to have attracted but little attention, in spite of their extremely favorable character. The high price of the remedy is probably largely answerable for this dearth of material, and it is to be hoped that the remedy will become more accessible for extended studies. The investigations of these authors were made solely in epileptic cases, and we possess very little knowledge as to the precise physiological action of this remedy. There can be no doubt but that the base rubidium is possessed of influence, although Botkine (THERAPEUTIC GAZETTE, September 15, 1888) has shown that the difference between the salts of rubidium and of potassium is purely quantitative, the salts of rubidium acting more energetically than those of the cæsium, and more nearly approaching in their action the salts of potassium.

This conclusion, it should be noted, does not confirm the hypothesis of Professor Laufenlauer. He believes that the activity of the metallic bromides is in direct proportion to their atomic weight. It must be admitted that even Professor Laufenlauer's clinical results scarcely confirm this view, for although rubidium has an atomic weight of 85.2 contrasted with 39.04 of potassium, he does not even claim that the action of the rubidium salt in epilepsy is greater than that of the potassium salt. Accessible clinical data are as yet insufficient to determine the therapeutic value of the rubidium salt, but it is evidently highly desirable, before further experiments be made with this addition to our list of remedies, that

a more accurate idea of its physiological action be obtainable. This has been accomplished by Drs. Tanzt and Vas, who publish in the *Internationale Klinische Rundschau* for October 26 and November 2, 1890, an elaborate essay, based upon experiments made with the bromide of rubidium and ammonium in the laboratory of Professor Korany, in Buda-Pesth.

These authors have found that, administered subcutaneously to the frog, in doses of 4½ grains, fibrillary contractions occur at the point of injection, and soon extend to the entire muscular system. Respiration and voluntary movements decrease in energy in four or five minutes, and soon symptoms of slight anæsthesia appear in the hind extremities, and gradually extends throughout the entire body. After twenty minutes there is general anæsthesia, even the cornea is insensitive, and the posterior extremities paretic; on opening of the thorax, although respiration has ceased, the heart still continues to contract rhythmically, although feebly. When the dose is increased, the first signs of irritation are more violent, and anæsthesia and paralysis develop more rapidly.

Analogous symptoms were produced in mammals. 15 grains introduced by means of an œsophageal tube into the stomach produce at first signs of increased muscular activity, passing gradually into general clonic convulsions, which soon gave place to paralysis, anæsthesia gradually being produced, until finally the entire body is insensible to irritation. The pupils are then largely dilated, the action of the heart weak and frequent, and respiration slowed. After the administration of such doses, recovery, as far as the motor symptoms, is complete within twenty-four hours, although the sensory organs still remain depressed below normal. The urine contains albumen, the temperature is reduced below normal, and death occurs in four or five days from disturbed respiration.

When 45 grains are given by the mouth to a rabbit, death is produced in two hours, the animal being absolutely anæsthetized and paralyzed. 75 grains produce almost immediate death, with symptoms of asphyxia. Continued administration of this remedy by the mouth leads to gastric catarrh, which, if large doses have been given, is recognizable by erosion, infiltration of blood, and desquamation of the epithelium of the mucous membrane.

The authors believe that their experiments have shown that there is a diminished irritability of the motor areas of the cortex following the use of this double salt, since they found that after its administration a stronger current was required to produce movements on stimulation of the motor areas than was previously the fact. Such a conclusion, however, cannot be accepted as demonstrated, for they add that they have found that, even in cases where the drug was administered by the stomach, there was diminished irritability both of muscles and motor nerves, and the paralysis is, therefore, much more reasonably attributed to the latter cause than to action on the cerebral cortex. Nevertheless, it is evident from the primary stage of increased reflex irritability, the modification in the respiratory rhythm, and the final suppression of reflexes, even although the motor nerves and muscles are not absolutely paralyzed, that this remedy is not without action on the central nervous system. Any action on the cortex has not yet, however, been proved. During the stage of increased reflex activity, the contractions of the heart are more frequent and more powerful, while in the final stages pulsation is slower and weaker, though still rhythmical. Extremely concentrated solutions of the rubidium and ammonium bromide rapidly produce paralysis of the heart in diastole. In certain cases they observed that the heart continued beating rhythmically for an hour or more after the production of the stage of complete paralysis, thus seeming to show a deviation from the belief generally held that potassium salts paralyze the heart. In fact, in the case of rubidium having a greater atomic weight, if the suppositions of Laufenlauer are correct, we would expect an even more energetic effect.

To determine the share of the different components of this double salt in producing this result, the authors made a few experiments with the pure rubidium bromide, and a comparison of these results with those which followed the administration of the double salt seem to show that while the rubidium bromide acts more intensely in paralyzing the spinal cord and heart, the rubidium ammonium bromide produces but slight action on the spinal cord, and a very prolonged irritant action on the heart. The less depressing action of the double salt on the heart, contrasted with the pure rubidium bromide, is, therefore, partly attributable to the ammonium in the combination, and to the difference in the amount of alkali in each; for the proportion of rubidium in the rubidium ammonium bromide is as .064 to

.103 in the pure rubidium bromide. It thus would appear from the authors' studies that under the influence of rubidium ammonium bromide the sensibility and motility are depressed before the reflex action is entirely suppressed, and respiratory movements are arrested considerably later than voluntary movements, and that the heart preserves its function still later; that sensibility is earlier arrested than motility, and the spinal cord loses its irritability sooner than the nerve-trunks.

This class of effects, therefore, constitute a marked difference to the action of the bromide of potassium, under whose influence motility is generally affected earlier than sensibility, and the nerves and muscles become paralyzed before the spinal cord.

In guinea-pigs, made epileptic by Brown-Séquard's method, this salt produced no effect, though potassium bromide was likewise inefficacious.

By their contribution to the comprehension of the physiological action of this double salt, a step in advance has been taken towards the determining of its therapeutic action, and the prospects of its proving of value are extremely encouraging.

THE CURE OF TUBERCULOSIS.

FOR the past weeks the daily newspapers have been filled with the most sensational stories from Berlin as to the wonderful revolution which was to occur in the therapeutics of tuberculosis from the discoveries of Koch; and several English and American journals have published what purports to be a translation of the original article by Koch, stated to be published in the *Deutsche Medicinische Wochenschrift* for November 14, 1890. Reference to that periodical shows, however, that no such article has been published by Dr. Koch, and the authenticity of the statements of the most exaggerated character, which have been going the rounds of the lay and medical press, seems, therefore, to say the least, doubtful.

When Koch announced at the last International Congress that his investigations warranted him in forming some hope as to the possibility of the discovery of a remedy which might prove of the greatest value in tubercular affections, the interest excited by these statements was only equalled by the hope that they might be founded on fact.

In the articles referred to no apparent advance in Koch's data seems detectable, while the composition of the remedy is still preserved a secret. The latter state of affairs is excused by Koch as attributable to the incompleteness of his studies, and the fact that the preparation of the remedy entails so much expense and excessive care that its publication might lead to the throwing on the market of worthless imitations. To us in America such a state of affairs is almost incomprehensible. If the publication of his formula is not warranted by the state of his investigations, the statements which are said to emanate from Koch are in the highest degree reprehensible, especially in view of the fact that it is said that Koch's assistants are absolutely coining money in the treatment of, according to one reporter, two hundred cases of tuberculosis daily. It is needless to say that such a state of affairs appears not to be without precedent, for it seems to be the general practice to protect all new remedies of German origin by trade-marks and patents. For an investigator of such eminence as Dr. Koch the line of procedure in the promulgation of his results is certainly most dubious. Should but a moiety only of his claims be founded on fact, we could, perhaps, for the great benefit which would accrue to mankind, overlook the manner of its introduction; but we must wait until we know what is being done, besides how it is being done, before we can place any reliance on the claim that a cure for tuberculosis has been discovered.

Since writing the above we have received the extra edition of the *Deutsche Medicinische Wochenschrift*, in which Dr. Koch's article, already referred to, has been published; but, with the exception that we must, with regret, admit that Dr. Koch is himself largely responsible for the statements alluded to, we find nothing in the article to cause us to change our opinion as to the mode and matter of his latter statements. No scientific value can be attached to the results claimed to follow the administration of a remedy which is only described as consisting of a "clear, brownish liquid, which, without any special precautions, is perfectly stable."*

AN OBJECTIONABLE RULE OF THE PHILADELPHIA BOARD OF HEALTH.

IT is hardly possible to frame laws for the protection of public health which will not work hardships in individual cases, and

* "Das mittel besteht aus einer bräunlichen klaren Flussigkeit, welche an und für sich, also ohne besondere Vorsichtsmaasregeln, haltbar ist."

while the majority of the regulations of most Boards of Health are wise and for the greatest good of the greatest number, there is one in force in Philadelphia that seems to be an exception.

The following case has recently come under our notice and is quoted in point:

A child, a resident of this city, went on a visit a few miles beyond the county line. While there it contracted diphtheria, and died on a Saturday. The parents were naturally anxious to bury the body in the family lot in a cemetery within the city limits. On application to the health office they were confronted with the following rule: "No body of a person who has died of any of the above-named contagious diseases—*i.e.*, Asiatic cholera, yellow fever, cerebro-spinal meningitis, small-pox or varioloid, diphtheria, relapsing fever, typhus fever, or scarlet fever—shall be brought into the city of Philadelphia for interment *without a special permit of the Board of Health.*" This rule in itself is a very proper one, but it is in the method of its execution that it is open to objections. The applicant for the permit was told that the Board of Health met only *once a week*, on Tuesdays, and no one in the health office had authority to act in the matter. The consequence was that the friends were compelled to keep the child's body from Saturday morning until Wednesday morning.

This certainly is in direct opposition to hygienic laws, and is entirely in opposition to the sentiment of the Board of Health in another rule, which says, "Burial (in cases of deaths from such diseases as mentioned above) to take place within thirty six hours."

It is quite possible that a body might have to be kept an entire week, unless the friends were willing to bury it in a cemetery out of the city limits. It does not seem to us that the community is exposed to any more danger from the passage of a body, dead from a contagious disease, from the city line to the burying-ground, than from the house in which the patient died in the city to the cemetery, particularly if the admirable requirements of the Board of Health as to the treatment of the body are carried out. These are, in brief, that immediately after death the body shall be completely enveloped (and remain so enveloped) in a sheet saturated with a four per cent. solution of chloride of lime, or a five per cent. solution of pure carbolic acid, or a .1 of one per cent. solution (1 : 1000) of corrosive sublimate, and be encased in a coffin or casket, the entire inner surface of which shall be thoroughly and completely lined with a layer of raw cotton of a thickness of not less than one inch, and the coffin tightly closed with screws, and remain so closed. Or the body, wrapped as above, shall be encased in a coffin or casket of metal, with all joints and seams closely soldered.

Of course, it is to the best interests of the community that no cases of contagious disease be brought into the city, and some legislation as to the importation of such cases would seem to be of far more value than the restrictions placed upon the burial of such as have succumbed in the immediate vicinity of Philadelphia County. This city covers such an enormous area, and there are so many families who live just beyond its limits whose interests are all here, that it seems an unnecessary cruelty to condemn them to the possibility of additional trial in the delayal of a funeral while waiting, possibly an entire week, for the Board of Health to grant the necessary permit. If the rule were an absolute one,—that *no* bodies dead from specified contagious diseases should be brought into the city, as is the case with the removal of bodies *from* the city, except for the purpose of interment in the adjacent rural districts,—much of the apparent hardship would be removed; but, where permission can be obtained on the specified day of the Board meeting, it does seem of doubtful utility. It is fair to say that during quarantine season the Board meets daily. The remedy, in our judgment, is to authorize the health officer or the chief clerk to issue a permit, when requested, on the days that the Board holds no meeting, and so do away with all complaints on this subject.

Reports on Therapeutic Progress.

FURTHER COMMUNICATIONS IN REGARD TO THE REMEDY AGAINST TUBERCULOSIS.

The following is a full translation of Koch's last article on the cure which he claims to have discovered for tuberculosis, which was published in the extra number of the *Deutsche Medicinische Wochenschrift* of November 14, 1890:

In an essay that I delivered some months ago before the International Medical Congress I mentioned a remedy which is able to render animals experimented on impervious to the

tubercle bacillus in the first instance, and in animals in which the disease had already begun, to bring the process to a stand-still. In the mean time experiments have been made with this remedy upon human beings, and their results may now be announced as follows: It was really my purpose to complete the experiments and to gain more experience in the use of the remedy in practice, as well as a greater knowledge of it in general, before publishing it. But, in spite of every precaution, too much of it has found its way before the public, and that, too, in a disconnected and exaggerated form, so that now, in order not to let any false impression be circulated, I feel myself forced to publish a paper, at the present state of affairs, in order to set myself right before the people. At any rate, an article just now must be brief, and leave unanswered many important questions. The experiments have been made, under my direction, by Dr. Libbertz and E. Pfühl, the latter being staff-surgeon; and they are, to an extent, still in progress. The necessary clinical material was furnished by Professor Brieger, from his polyclinic; by Drs. Fraentzel and R. Köhler, the former a physician and the latter chief staff-surgeon in the Charité Hospital; as well as by Herr Geheimrath von Bergmann in the surgical clinic of the University. To all these gentlemen, as well as to their assistants, who have been of such great assistance to me in these experiments, I would like at this point to express my deepest thanks for the lively interest they have shown in the subject and for the disinterested kindnesses which they have shown towards me. Without such varied assistance it would have been impossible to carry on such numerous and satisfactory experiments within several months.

I cannot just yet give an answer in regard to the origin and preparation of the remedy, but shall have to reserve this subject for a later communication.* The remedy consists of a clear, brownish liquid, which can be preserved without any special precautions. This liquid is to be more or less diluted for use, and the dilutions, even if they be made with distilled water, are liable to decomposition; they rapidly develop germs, become turbid, and are no longer fit for use. In order to guard against this, the dilutions are to be sterilized with heat, and kept protected by cotton-wool, or, what is easier, to be preserved by the addition of a five per cent. solution of phenol. By too frequent sterilization, as well as by too great addition of the dilution of phenol, the effect—that is, in too much diluted solutions—seems, in time, to be lessened, and I have, therefore, always preferred a freshly-made solution.

The remedy has no effect upon the stomach; in order to exert its effect it must be injected subcutaneously. We have used exclusively in our experiments a little syringe made by me for bacteriological work. This is provided with a small gum ball, and has no piston. Such an instrument can be easily and safely rendered aseptic by means of absolute alcohol; and we mention this fact, because in more than one thousand injections not a single abscess has arisen from its use.

After several trials in other places, we selected the skin between the shoulders on the back and in the lumbar region as the general seat of our experiments, because the injections in these places showed the least local reaction, and were almost painless.

Now, in regard to the effect of the remedy on man, it was noticed in the beginning that human beings differed very markedly in one important point from the guinea-pig, which is usually employed. Evidence was also obtained emphasizing the rule which experimenters cannot be too much impressed with, —viz., that, in making our experiments upon animals, we must not jump too hastily to the same conclusions in regard to men. Men proved themselves very much more susceptible to its effects than the guinea-pigs. A healthy guinea pig can receive subcutaneously from 1 to 2 cubic centimetres of the pure liquid without being visibly influenced by it. On the other hand, a healthy-grown man is very noticeably affected upon receiving .25 cubic centimetre in the same manner. In other words, calculating by the body-weight of the two beings, a man is markedly affected by $\frac{1}{1500}$ of the quantity which exerts hardly any influence upon the guinea-pig.

The symptoms, arising in men after an injection, I have experienced in my own person, having made an injection into my arm; and these symptoms were briefly as follows: In three or four hours after the injections there came on pains in the limbs, faintness, disposition to vomit, and dysp-

* Physicians who wish to make experiments with the remedy can obtain it from Dr. A. Libbertz (Berlin, N.W.), Lünebarger Strasse, 28 II.), who, with Dr. Pfühl and myself, has undertaken to furnish it. Yet I would add that the supply at hand just now is very small, and that, after a few weeks, it can be obtained in larger quantities.

nœa, and they rapidly increased ; in the fifth hour there occurred a rigor, which lasted nearly sixty minutes ; then there followed nausea, vomiting, and a rise in temperature to 39° C. About twelve hours afterwards all these symptoms abated. The temperature went down, and on the next day was nearly normal. Pains in the limbs and weakness continued several days longer ; and, likewise, the places of the injections remained for quite a while slightly painful and reddened.

The lowest limit in the remedy that will produce any effect in healthy men is about .01 cubic centimetre, which is about one cubic centimetre of a one-hundredth dilution ; and this was proved by many experiments. Most men reacted to these doses by experiencing only slight pains in the limbs and a faintness, which quickly passed off. In a few cases there was a slight ascent in temperature, which went up to 38° C., or even over.

When the animals we experimented on were compared as to their body-weight with men, there was a very marked difference between them, but in other respects they agreed pretty well.

The most important of its qualities is that of exerting a specific effect upon tuberculous processes, no matter of what nature they may be.

I shall not further discuss this remedy in connection with animals, but devote my whole attention to the most important subject of its relation to mankind. The healthy man either did not react, as seen above, when experimented on with .01 cubic centimetre, or did so very slightly. This fact, then, is of great value in proving when patients are not tuberculous. But it is seen entirely different with those who have the disease or those who are tuberculous. When the same dose of .01 cubic centimetre is injected into this latter class, it is followed by a severe local and systemic reaction.*

The latter reaction consists in a rise of temperature, which, beginning, as a rule, with a rigor, causes the body heat to go up to over 39° C., often to 40° C., and sometimes even as high as 41° C. We then noticed the pains in the limbs, irritation of the throat, great faintness, and often nausea and vomiting. At times there was a slight icteroid discoloration in some cases, as well as a breaking out upon the neck and chest of an eruption something like measles. The occurrence of the symptoms begins generally in from four to five hours after the injection, and lasts from twelve to fifteen hours. Exceptionally it comes on later, and then runs a milder course.

The patients were generally not troubled by the reactions, and, as soon as they were over them, felt better than they did before.

The local effect can be best observed in such patients as have tuberculous affections perfectly visible,—*e.g.*, in lupus. In these there are observed changes, which very surprisingly show its specific antituberculous effect. Some hours after the injection, which had been made in the skin of the back and in other parts remote from the local manifestation of the disease on the face, the lupus spots began to swell and redden, and that, too, generally before the coming on of the rigors.

During the fever the swelling and reddening increase, and may go on to such a marked degree that the lupus tissue becomes in places brownish red and necrotic. In the more sharply-defined lupus foci the much-swollen and brownish-red centres were surrounded by white bands one cubic centimetre in breadth, which, in turn, were bounded by a red margin.

After the decline of the fever, the swelling of the lupus spots gradually decreased, so as to vanish after two or three days. Those spots that have been covered with crusts formed by the serum gradually oozing out and drying in the air, change into scabs, which, in from two to three weeks, fall off, and leave a clean cicatrix after repeated injections of the remedy. Generally, however, it requires several injections for the complete removal of lupus tissue. But of this later. Also, it must be emphasized, that changes produced by the remedy were confined on the surface to those parts affected by the lupoid changes.

Even the smallest and most invisible tuberculous nodules concealed by tuberculous tissue come to light, and, in consequence of the swelling and change in coloration, are recognizable ; while the real cicatricial tissue, in which the lupoid changes had entirely vanished, remained unchanged.

The observation of a case of lupus treated with this remedy is so convincing and instructive that every one is advised to begin his studies in reference to the specific nature of this remedy with experiments on a patient of this kind.

Less striking, but still sufficiently percepti-

* Children aged from 3 to 5 years received a tenth of this dose; very frail children were given only .0005 cubic centimetre, and this was followed by a severe but not alarming reaction.

ble to the eye and reason, are the local effects obtained in tuberculous diseases of the lymphatics, bones and joints, and other parts, in which swelling, increase of pain, and reddening of the surrounding tissues are to be seen.

The effect upon the inner organs—such as the lungs—is noticeable, if the somewhat increased coughing and sputa of the phthisical patient after the first injection be not attributed to its local effect. In such cases the general effect is the principal one. It must also be added that, in this instance, the effects are similar to those in lupus.

The reactions given above were noticed upon the administration of a dose of .01 cubic centimetre, so that I do not think that it is going too far for me to state that in future this remedy will be a *necessary aid in diagnosis*. We shall by this means be able to diagnosticate doubtful cases of incipient phthisis when it is impossible to arrive at a sure prognosis in reference to the disease, either by a discovery of bacilli or of elastic fibres in the sputa or by physical examination. By this means tuberculous affections of the lymphatics, concealed diseases of bone, and doubtful tuberculous affections of the skin may be easily and safely diagnosticated as such. In apparently worn-out cases of tuberculosis of the lungs and joints we shall be able to find out whether the disease has really stopped for good, or whether it is, like a dead coal, still lurking in the system, waiting for a favorable opportunity at which it may begin afresh. But its power as a remedy against suffering is even greater than that which it possesses for diagnostic purposes. In marking the changes produced by a subcutaneous injection of the remedy upon lupoid spots, it has already been observed that, after the vanishing of the swelling and reddening, the lupus tissue does not regain its original condition, but is more or less destroyed, and vanishes away. In various cases, judging from appearances, we find that the diseased tissue, after a thorough injection, dies, and is later thrown off as a dead mass. In other instances there seems to come on a shrivelling or melting away of the tissue, which, in order to be complete, requires the remedy to be very often repeated.

The process by which this is accomplished we cannot yet be sure of, since we are, as yet, unable to pursue our histological examinations to that degree of perfection. Only this much can be said with certainty,—viz., that the ulterior object to be obtained by the use of this remedy is not the destruction of the bacilli themselves, but only the tissue in which they dwell. Into this tissue we notice the entrance of the effects of the remedy by the marked swelling and reddening, as well as the great changes in the circulation produced by it, and the great changes in nutrition attributable to it, which processes must sooner or later destroy the tissues upon which they are at work.

To briefly summarize what I have written, I would state that the remedy does not destroy the tubercle bacillus, but the tuberculous tissue. But its power is not without limit in this direction. It is able to exert an influence only upon living tuberculous tissue. Upon such as is already dead—*e.g.*, dead, caseous masses, necrotic bones, etc.—it has no effect, and but a very limited effect upon such tissue as has been already destroyed. In these dead tissues bacilli may still remain alive, and such may be either crowded aside with the necrotic tissue, or, if the relations be favorable, they may again find entrance into the surrounding parts.

This quality of the remedy is also to be carefully studied if we would perfectly apply its therapeutic effect, and this is that the living tuberculous tissue be changed into dead matter, and then everything will contribute as speedily as possible to its early removal,—*e.g.*, by surgical methods; but where this is impossible, and the removal of the mass can be accomplished only by slow, natural processes of tissue-change, the surrounding parts are to be jealously guarded against the entrance of parasites.

Next in sequence, after the fact that the remedy destroys tuberculous tissue, and that, too, only when it is living, there naturally comes another valuable suggestion in reference to it, and that is that it can be given in rapidly-increasing doses. This fact might naturally suggest the danger of one's becoming habituated to the use of the injection. But when we remember that the administration of the dose extended over the space of about three weeks, and that during this time it was increased as much as five-hundredfold, comparing the incipient with the later doses, we see that there need be no apprehension of habituation,—a conclusion that is strengthened by the early onset and rapid amelioration of the symptoms.

It is still to be explained how that at first much tuberculous tissue is present; and, on the other hand, a small mass of real substance succeeds in producing a strong re-

action; but a certain quantity of tissue, capable of reaction, is destroyed by every injection. Then, again, within certain limits, there may be some danger of one's getting habituated to it. As soon as a tuberculous patient is treated with ascending doses until the effect becomes *nil*, then it is fair to assume that in his case all tuberculous tissue capable of reaction has been destroyed. Therefore, we must use precautions around the patient, so long as bacilli are still present in his body, so as to keep him more protected against any new infection, by the steady use of increasing doses of the remedy, with occasional intermissions. Only the future can show whether this premise and conclusion are right. They have been hastily gone over by me, in order thereafter to explain the manner of the use of the remedy, which, in our experiments, is as follows: In order again to begin with the simplest case,—namely, that of lupus,—we commenced, in nearly every instance, by injecting the full dose of .01 cubic centimetre. The reaction was then allowed to pass off, and after from one to two weeks the previous dose of .01 cubic centimetre was given, thus increasing until the reaction became less and finally ceased altogether. In this way the lupus spots, in two cases of facial lupus, were, by two or three hypodermics, made to present a smooth cicatrix; the other patients with lupus improved in proportion to the length of time they submitted to treatment. All these patients had been affected many years, and had before this been treated in various ways without success.

Tuberculous diseases of the lymphatics, bones, and joints were treated in a like manner, but with larger doses and at longer intervals. The result was similar to that obtained in the case of lupus. In new and moderate cases there was a rapid amelioration of the symptoms, resulting in recovery; in more severe cases the improvement was slower.

The case is somewhat different with consumptives, who constitute the majority of our patients; for when the latter are suffering with pronounced cavities, they are far more susceptible to the remedy than they who have tuberculous affections coming under the head of surgery. We had, in the case of consumptives, to diminish very much the general commencing dose of .01 cubic centimetre, and found that these patients strongly reacted from a dose of from .001 to .002 cubic centimetre; but that this can be rapidly increased to the regular dose taken by other patients. We, therefore, began, in the case of consumptives, with the dose of .01 cubic centimetre, and this dose was daily repeated until it caused no reaction, though, at first, it was followed by a rise in temperature. Then the dose was increased to .02 cubic centimetre and kept there until it caused no appreciable effect, after which it was gradually increased .01 cubic centimetre and even beyond.

By proceeding in the above manner, it may be found that we can increase the dose gradually, with but a slight rise in temperature, and almost without the knowledge of the patient. This easy course seems the most advisable, especially in weak patients. Some stronger patients, however, were treated with larger or more rapidly increased doses, and the favorable effect seemed to follow more quickly. This latter was so pronounced in consumptives that, as a rule, the coughing and expectoration increased after the first injection; then decreased, and in favorable cases vanished altogether. The sputa also ceased to be purulent and became viscid. The number of bacilli—for only such patients are selected—generally decreased when this viscidity of the sputa appeared. They then vanished entirely, appearing only at times, until the expectoration ceased altogether.

In like manner the night sweats ceased, their appearance improved, and the patients increased in weight. The course of treatment in cases of patients with incipient phthisis lasts generally from four to six weeks, when their symptoms cease, and they may be considered well. Patients with not too large cavities are markedly improved and nearly cured. Only in such as had large cavities were no objective improvement to be marked, although the sputa decreased and they felt better. Therefore, with the above experience, I feel that I am justified in saying *that incipient phthisis is with certainty to be cured with this remedy*. Although this statement is applicable, to an extent, to cases not too far advanced.

But consumptives with large cavities, and in whom there are to be found most complications, caused by microbes and other pathological changes, receive a lasting benefit from being treated. It is, therefore, to be concluded that the disease itself is influenced in them in the same manner as in the less-affected patients, but that they are unable to cast off the dead tissue from the parts affected by secondary suppurative processes.

The question has been mooted as to whether many of these patients may not be benefited by the assistance of surgery, as in empyema, or by other therapeutic or hygienic means at our command. In answer to this, I would adhere to the present system being fully and somewhat diagrammatically carried out by its adherents in the treatment of tuberculosis. This plan may be best pursued in the treatment of incipient phthisis and in purely surgical tubercular affections, but all other forms of tuberculosis are to be treated only by medical means, being careful that each patient received such treatment as is best suited to his individual case. In many cases I have been persuaded that the care of the patient was of great importance, so that I would for this reason recommend the management of the patients in hospitals rather than by means of the home or out-door treatment. Of course, such methods of treatment as going to the mountains, living in the open air, and getting good food to eat, are naturally suggested in connection with the above mode of treatment; but I believe that this new method can be best combined with the former one in sanitariums, especially in old and aggravated cases of the disease.

The great difficulty, as said above, is in the early discovery of the disease. The first object of the treatment should be the perfect diagnosis of consumption, because the power of our remedy hinges on this. In future it will be the great aim of the physician to be certain about this fact as soon as possible. The discovery of tubercle bacilli in the sputa, which till now has been regarded only as an interesting and scientific means of confirming a diagnosis, and, as it was considered practically of no value, it was often omitted, is no longer to be regarded with indifference, but in all cases the sputa are to be carefully examined.

Any physician who, at the present time, with all the present means of confirming diagnosis, fails to examine the sputa, is guilty of neglect of his patient, because the life of a human being may be dependent upon the early discovery of this fact. In doubtful cases the trial of an injection as a means of confirmation is to be used.

The new remedy will be a true blessing to mankind when we can quickly diagnosticate tuberculosis in its early stages, while yet amenable to treatment, and not have to wait until it has gotten beyond our control and become an unfailing source of infection, as it has been in our forefathers and mankind to day.

Finally, I would say that I have purposely omitted all statistics in these pages, because the physicians who have furnished me with clinical material, have kept the reports of their different cases, and I did not wish to intrude upon the material which they have selected for their own use.

DR. J. ROUSSEL'S TREATMENT OF PHTHISIS.

While the Berlin papers have been seriously discussing the hopes entertained that Dr. Koch's investigations may lead to the discovery of a remedy for tuberculosis, the Parisian press has diverted its readers with descriptions of a wonderful process by which Dr. J. Roussel is said to perfume the human body with such scents as that of the jasmine, the heliotrope, etc. The hypodermic injection of the essences of these plants would give to the breath and the exhalations of the skin the sweet savor of delicate flowers. Strange to say, the Parisian gossip and the scientific talk of the Berlin press are intimately connected one with the other. We need hardly remark that Dr. Roussel, the well known physician who invented the instrument for the transfusion of blood, has not devoted himself to the art of perfuming beauties, professional or otherwise, of Parisian society. But he has taken up from the very first the principle of hypodermic injections for the treatment of a great number of diseases, and notably for phthisis. Perhaps, however, the fantastic stories related with regard to the perfuming of the body have arisen from Dr. Roussel's treatment of morphiomaniacs and inebriates of chloroform, ether, etc. To patients of this description he has suggested innocuous hypodermic injections of aromatic vegetable essences or perfumes, and has thus diverted the minds of such sufferers. But he has never advised any healthy person to practise hypodermic injections of scents or any other substance whatsoever.

Dr. Roussel's theory is that all the symptoms of phthisis are the efforts of nature to throw off the microbe which is destroying the system. The suppurations, expectorations, are nature's attempts to get rid of the invading bacilli. The high temperature burns the leucomaïnes, etc., that circulate in the blood; the abundant night-sweats, the diarrhœa, and surcharged urines are all so many modes of elimination. They are the arms which nature has given the human body to

expel those animal particles which have been rendered injurious by the invading microbe. Therefore Dr. Roussel maintains that true science rests in the use of such therapeutics as will attack only the microbe, and that we ought not to try to diminish the power of those weapons which our organism employs in self-defence. Rather should we seek to increase the vitality of the subject who serves as a field of battle between human life and the life of the microbes. But remedies swallowed injure and disturb the organs of digestion, and therefore weaken the patient, while they altogether fail to reach the lungs, where the microbes are located. General hygiene, constant ventilation, plenty of sunlight, and sanitary knitted woollen clothing are all strongly advocated by Dr. Roussel. When these are secured a general improvement in the condition of the patient is often noticed, and it is the good hygiene rather than the drugs given that secures such amelioration. To prove the efficacy of a drug, the improvement should take place when no alterations are made in the patient's surroundings and mode of life. This is what Dr. Roussel professed to have accomplished by conveying through the medium of the blood, direct to the lungs, antiseptics fatal to the life of the bacillus of Koch.

The method employed is simple, the practice easy, but the indications given must be rigorously observed, otherwise unpleasant accidents may result. Eucalyptol is Dr. Roussel's favorite antiseptic, which he uses in the proportion of twenty per cent. for his hypodermic injections. But if this or other medicaments are diluted in some substances very grave accidents may result. Dr. Roussel employs pure sterilized olive oil, as this is a substance not foreign to the usual nutrition of the human body. It is easily saponified and assimilated by the organism. This is effected as readily by the capillaries of the skin as by the digestive tube. But oils of a mineral base, such as petroleum, etc., are rejected as being artificial, irregular, and even caustic. The volatile essence contained in the sterilized olive oil travels with the blood till it reaches the lungs, and there, being placed in contact with the air the patient breathes, becomes diluted in the lungs, evaporates, and escapes with the breath. Thus the patient's breath smells of eucalyptol very shortly after the injection, and subsequently both the sweat and the urine have the same odor. When thymol is used, the odor is very pleasant, and several patients have been surprised and pleased to find how sweetly they were perfumed by this medical treatment.

Naturally the injections have to be taken for several months, as the perfumed effluvia must be absorbed; must, in fact, embalm the entire body, to preserve it, as that of a mummy, against the destructive microbes. The friends or nurse of the patient can easily be taught how to perform the operation. This, done systematically and persistently, will, Dr. Roussel maintains, kill the bacillus of Koch, especially if it be a case, not of inherited, but of contracted phthisis. The first cases treated in this manner by Dr. Roussel date as far back as 1883–84, and some of these patients have enjoyed good health ever since. A female patient of the late Dr. Fauvel, the eminent physician who presided at the International Congress of Hygiene of 1878, was sent to Dr. Roussel by Dr. Fauvel. Her right lung was affected, and numerous bacilli had been found in her sputa. The treatment commenced in January, 1883, and in January, 1884, the bacilli and all acute symptoms had disappeared; the patient gained weight, and has ever since been able to work, earning her living as a sempstress. This patient has been seen and examined by numerous physicians, and the case is interesting principally because it is one of the earliest on record. In the month of March, 1888, Dr. Roussel brought before the Society of Practical Medicine eighteen patients suffering from phthisis. In the month of March, 1889, he brought the greater number of the same patients before the Society, so that they might be examined by the same medical men who had seen them a year previously. These eighteen patients had received altogether four thousand seven hundred and fourteen hypodermic injections. One of the eighteen patients, who seemed to have recovered his health, started on a journey, contracted double pneumonia, and died. Drs. Tison, Guerder, Duchesne, Gaudin, Thermes, Boyer, Gronineau, and others examined, at the end of the year, fifteen or sixteen out of the eighteen patients. They all testified that the place where these numerous hypodermic injections had been administered remained in a perfectly normal condition. There was no inflammation. Dr Dujardin-Beaumetz presided at this sitting, and a resolution was carried to the effect that the numerous injections of various substances had left no trace whatsoever. On the other hand, the patients were either to all appearances cured, or very greatly improved in health. In several instances the analysis of the sputa

showed that the bacilli of Koch had disappeared altogether. Apart from these particular cases brought before the Society of Practical Medicine, Dr. Roussel has some thirty double analyses of the sputa of his patients made either at hospitals or by eminent bacteriologists. The first of these two analyses for each patient shows that the bacilli of Koch abounded in the sputa. The second, made generally twelve months later, declares that the bacilli had disappeared.

In 1886, Dr. Benjamin Ball made experiments at the Laennec Hospital for Incurables, carrying out Dr. Roussel's system. Out of twenty-one patients, ten were able, after treatment, to leave the Hospital for Incurables and resume their work, five were still under treatment at the time these facts were reported by Dr. Ball to the French Academy of Medicine, six had died. Dr. Ball stated, in his report to the Academy of Medicine, that the hypodermic injections had a marked effect on the "septic" symptoms of phthisis, — namely, there was a cessation of night-sweats, of diarrhœa, a reduction of the expectoration and the fever, together with improved appetite. Dr. Ball could not affirm that a cure had been found for phthisis, as the experiments had not been made on a sufficiently extensive scale; but evidently there was good ground for hope.

On July 7, 1887, Dr. Roussel explained to the Society of Practical Medicine that one of the great obstacles to the diffusion of the hypodermic method was the imperfection of the instruments. The syringe generally used for the injection of morphine is altogether unsuited for constant treatment. The metal is too readily oxidized, and the instrument cannot easily be kept clean. Nor are the needles long enough to traverse the dermis. The liquid oozes out again through the channel pierced by the needle, and irritates the nerves and capillaries on the surface of the skin. Dr. Roussel employs a syringe made of celluloid,—a substance composed of camphor and cellulose treated by nitric acid. Hard, transparent, unbreakable, non-porous, it cannot be affected by the metalloids and alkaloids used for hypodermic injections. The needles are of steel, covered with platinum, and four centimetres in length. They carry the liquid under the cutis as far as possible from the puncture on the skin. By the nature of the instrument employed, by the antiseptic precautions taken, by the easy assimilation of the vehicle—sterilized olive oil—in which the medicament is diluted, all accidents that might otherwise result from the constant practice of hypodermic injections are avoided. These latter practical considerations are, he considers, of the utmost importance, for many failures have attended this mode of treatment, not because it was wrong in principle, but because it was clumsily applied.

During the Medical Congress, held in Berlin last August, Dr. Roussel went to the Charité Hospital, and there performed many hypodermic injections on patients suffering from phthisis, to show how this could be done without inconvenience or accidents. Whatever may be the secret of Dr. Koch's treatment of phthisis, Dr. Roussel claims that, since 1883, he has, with marked success, treated this malady by hypodermic injections of metalloids and alkaloids. Dr. Roussel also has not hesitated to supply Dr. Koch, in response to the inquiries made by the eminent German professor, with full details as to his mode of procedure. In fact, there is no secret whatsoever in Dr. Roussel's system; the profession are welcome to make every inquiry, and he is ready to show everything, even his patients, to competent investigators.

Such are the main features of Dr. Roussel's claim to be heard on the question of the possible remedy for phthisis. In this description of the facts and arguments adduced by Dr. Roussel there is no attempt at criticism. The sole purpose in view is merely to state Dr. Roussel's case, for it cannot fail to be of interest when so many hopes are being awakened as to a possible remedy for phthisis.—*Lancet*, November 15, 1890.

PREVENTIVE INOCULATION IN TUBERCULOSIS.

The experiments of Koch have been calling attention anew to the preventive inoculation of tuberculosis, but it is not in the least a new field, for since it was first demonstrated that artificial immunity against acute infectious diseases could be conferred by this method, the possibility of the successful application to tuberculosis has occupied the minds of investigators.

In the *Medical Record* for November 22, 1890, DR. E. L. TRUDEAU publishes a paper on this subject, in which he shows that Dr. Falk, in a communication to the Medical Society of Berlin, was about the first to describe his attempts at preventive inoculation in this disease by means of tubercular virus attenuated by contact through fine material.

A. Marfan, in 1886, suggested the possi-

bility of attaining success by this method from clinical facts he had observed relating to the protective influence of healed lupus and scrofulous glands. H. Martin, in 1887, Raymond and Arthaud, and others, more recently, have described their attempts and experience in this line of investigation.

The improvements made in the technique of laboratory methods and the encouraging results which have recently been obtained in protecting living animals by preventive inoculation against a number of bacterial diseases has prompted investigators to renewed studies in this direction.

If we have been taught by the extended researches of the past years the difficulties which must beset the direct destruction of the tubercle bacillus in the tissues of man and animals by germicidal methods, we have also learned that a living organism possesses many and mysterious powers of resistance, that the margin between susceptibility and immunity, whether purely biological or chemical, is often a very narrow one, and that the most promise at present seems to lie in the study of nature's laws of immunity and in learning how far we may influence and imitate these. Immunity from disease being a part of the unsealed riddle of life itself, the study of its mechanism has ever been beset with apparently unsurmountable difficulties, and an exact knowledge of its laws as yet escapes us. Immunity from microbic diseases is usually a natural attribute of the living organism in which it resides, but we now know that, so far as certain infectious maladies are concerned, it may be conferred artificially, and this may be said to be true of variola and hydrophobia in man (if this be a microbic disease), and of anthrax, chicken cholera, and some forms of septicæmia and hog cholera in animals.

In tuberculosis mere physical vigor is no doubt a prominent element in the mechanism of immunity; indeed, it is the only element we can as yet seize, clinical observation and experimental research bearing ample evidence to the favorable influence which all external conditions of environment tending to increase bodily vigor invariably exercise over the prevention and course of the disease, and to the close association which exists between depressed vitality, with its cellular degeneracy and tubercular infection.

It is not, however, the only element, for it is in the prime and vigor of adult life that the disease displays its greatest activity, and strong men, whose tissues are apparently well nourished, at least so far as we can judge by the external appearance, frequently succumb to acute tuberculosis in a short time, while many debilitated and delicate individuals, living under the worst possible hygienic surroundings, and whose nutrition is constantly at the lowest ebb, never suffer from this disease. There appears to be, therefore, over and above the element of physical vigor, a natural immunity against natural means of infection in tuberculosis, as in all other infectious diseases,—an immunity possessed to a different degree by different individuals and species of animals, and which is quite sufficient for their protection, no matter at how low an ebb their physical vigor may chance to be. Whether we believe that immunity is due to the germicidal power of blood-serum, to the phagocytic activity of the cells, to purely chemical reactions intimately connected with the biological life of the tissues, to an unsusceptibility of the nerve-centres to the poisonous products of the microbes, to a combination of these elements, or to some factor as yet unknown, it is evident that the margin between immunity and susceptibility is a very narrow one at first, that some trifling chemical or biological variation in the tissues is capable of turning the scales for or against infection, and some hope would seem to lie in the possibility of artificially inducing this condition of resistance in them. Acquired immunity is established naturally by a previous attack, artificially by some form of inoculation. From a mass of more or less contradictory testimony regarding immunity by inoculation, we may seize this one prominent fact,—namely, that there resides in the living organism a certain power of habituation to noxious influences, one of the simplest expressions of which is to be found in the tolerance to poisonous drugs which may be brought about by graded doses, and the most complex in the protection afforded by vaccination. In variola, probably in hydrophobia, and in the group of diseases of animals against which protection can be artificially conferred, an immunity as complete, though not as lasting, as that established by a previous attack, may be obtained by some form of inoculation. All successful methods of inoculation so far rest upon the application of what, owing to our ignorance, we can as yet only designate in a vague way as the law of habituation, the virus which gives protection being generally either an attenuation or a modification of the same which causes the disease. In one instance this artificial protection will be induced by an artificially-modified or attenuated microbe;

in another, apparently by the chemical and metabolic products which the growth of the virulent microbe develops. Thus, in the septicæmia of guinea-pigs and in hog cholera the soluble products of the microbe's life-history, so far as the limited evidence at hand shows, prove an efficient protection in these animals against subsequent and repeated injection of the most virulent cultures; in chicken cholera the attenuated bacteria alone give protection, while in anthrax both the soluble products of the virulent germs and the attenuated microbe can render certain animals immune.

How universal is this law of habituation, through whose operation living beings can at will be rendered invulnerable to these deadly maladies? Is its protecting influence limited to the more active or rapidly fatal infectious diseases, or may it extend as well to the more chronic forms, such, for example, as tuberculosis? Certainly there has not in the clinical history of tuberculosis seemed to be much to foster the hope that any method of preventive inoculation is likely to be successfully applied to this disease; but some encouragement to investigation in this line may be derived from the possible universality of the law of adaptation to noxious influences generally, from the brilliant achievements of the past years in the field of vaccination, and from the recent improvements in methods of conferring artificial protection.

Can the tubercle bacillus, or the soluble products of its life history, when treated according to the teachings of modern science, be made to confer any degree of immunity against this disease? To collect and present some evidence on this point has been the object of the present study.

Modern methods of protective inoculation aim at obtaining virus mainly in two ways: 1. By securing the soluble products of the microbe's life-history freed from living germs. 2. By the production of an attenuated germ.

In the first series of experiments a non-living complex chemical substance was introduced as a protecting agent; in the second series, a living but attenuated germ.

SERIES I. — *Inoculation of Chemical Substances.*—In this set of experiments three forms of material were made use of,—1, surface cultures of tubercle bacilli, which, through the influence of heat and light, were dead, and refused to grow on the usual culture media; 2, liquid cultures of tubercle bacilli grown for a month and then sterilized by heat; 3, liquid cultures of tubercle bacilli freed from living germs by filtration through a porcelain filter. These substances were injected subcutaneously into fifteen rabbits, divided into three equal lots.

Lot 1.—Dead Surface Cultures.—Five rabbits received on three occasions, at intervals of four days, subcutaneously, 4 c.c. of dead surface culture suspended in distilled water in sufficient amount to make an opaque turbid emulsion. No disturbance of temperature or health followed; no abscess or irritation at the site of injection was noted; the animals were kept for six or seven weeks, when they were injected in the lung with ½ c.c. of slightly milky emulsion of living virulent tubercle bacilli.

Lot 2.—Sterilized Liquid Cultures.—Having grown pure cultures of tubercle bacilli in glycerin-peptone bouillon for a month, and proved their purity microscopically, the flask containing them is steamed for an hour. The liquid, in which are suspended the dead germs, is then cooled and injected, with antiseptic precautions, into the subcutaneous tissue of five rabbits, to the amount of 6 c.c. for each animal. These injections are repeated on five occasions, at intervals of five days, increasing gradually the amount to 12 c.c. to each animal. The subcutaneous introduction of this liquid was followed by a marked rise of temperature and by a trifling, but temporary, irritation at the site of puncture; not a single abscess occurred, and the rabbits, when inoculated with virulent culture four weeks from the last vaccination, were apparently in good condition.

Lot 3.—Filtered Cultures.—Having grown pure cultures of tubercle bacilli in glycerin-peptone bouillon for a month, and proved their purity microscopically, the entire contents of the flask is filtered with very slight pressure through a porcelain Pasteur filter. The clear filtrate proved free from germs, as shown when planted in fresh bouillon tubes, and two animals injected with this liquid and killed three months later presented no tubercular lesions. Injections of this filtered fluid, in the same amounts and at the same intervals as in the preceding lot of animals, were made in five rabbits. These gave rise in the animals to the same elevation of temperature which was noted in Lot 2, injected with sterilized liquid cultures. The temperature, usually about 102⅕° to 102⅗° F. at the time of the injection, falls a little during the first hour, then rises shortly until the fifth hour to between 106° and 107° F. It maintains itself at this high point until the eighth or tenth hour, when it slowly returns to the normal. Control rabbits, however, injected with the same

quantity of fresh glycerin-peptone bouillon show a rise nearly equal to the one described, and which presents an almost identical curve. This, coupled with the fact that large amounts of fresh surface cultures, when mixed with sterilized water and injected subcutaneously, give but a trifling rise of temperature, makes it questionable whether this high temperature may not be almost entirely due to the peptones and salts contained in the bouillon. No irritation occurred at the site of puncture, which was done antiseptically, though in the last injection 12 c.c. of the fluid were introduced at a time. No abscess and no permanent toxic symptoms followed, and the animals, which had been kept over two weeks after the last injection, were in excellent health when, together with their mates, they submitted to the final inoculation with fresh cultures. On the same day (February 22) all these rabbits,—Lots 1, 2, 3,—together with five fresh ones as controls, were inoculated in the right lung with ½ c.c. each of a suspension of tubercle bacilli in bouillon. Two months later the controls were killed, and the autopsies of the other animals—Lots 1, 2, 3—followed as rapidly as possible, extending over a period of less than two weeks. The results are briefly told: All the rabbits are more or less tubercular; the lesions of those in whom this preventive inoculation was practised differ from those observed in the controls but little, except that in the rabbits previously injected with the filtered cultures (Lot 2) the disease is somewhat more advanced. The experiment relating to this set of animals was, therefore, repeated in precisely the same way as before, except that the interval between the last preventive inoculation and the virulent inoculation was only three days. Four animals were used. Two months later, the two rabbits which had undergone the protective treatment were found to bear tubercular lesions appreciably further advanced than the controls.

The second set of experiments relate to preventive inoculation with a living but attenuated microbe. Our knowledge of the conditions necessary to either diminish or increase the natural virulence of the tubercle bacillus is still very fragmentary. Roux, Nocard, Yersin, and all the experimenters of Pasteur's school have stated that cultivation in glycerinated media so increases the virulence of Koch's bacillus that a germ is thereby obtained capable, upon intravenous injection, of killing rabbits with great regularity in eighteen to twenty-four days, the animals presenting a peculiar form of septic tuberculosis. Dr. Trudeau has never been able to produce in the ordinary rabbit for sale in our markets here the type of disease these investigators so ably describe, nor has he noted any marked increase in the pathogenic properties of the tubercle bacillus when it is cultivated in glycerinated media. Cultures which he has been able to make directly from the lesions of acute miliary tuberculosis in the human subject have not differed to any appreciable extent in their effects on animals from tubercle bacilli obtained from other sources. All attempts on the author's part at systematic attenuation of tubercle bacilli by placing them in an unfavorable environment have proved nearly as unsuccessful. Under what manipulation he has so far brought to bear on them individual cultures have been often so nearly killed as to lose much of their pathogenic power, but this could not be regulated with any degree of certainty, and failed to be reproduced with any regularity in subsequent generations; either the microbes would refuse to grow entirely, or the subsequent plants which grew soon regained their usual virulence.

Many pathogenic microbes when transferred from a parasitic to a saprophytic existence adapt themselves readily to their altered surroundings, which produce in them two important changes,—they grow more easily and abundantly in culture media, and they lose to a greater or less degree their power to maintain themselves in living beings; in other words, their virulence.

The tubercle bacillus, on the contrary, seems to adapt itself with some reluctance to a saprophytic existence, and is with great difficulty robbed of any degree of its virulence. Dr. Trudeau's observations in this particular coincide with those made by Dr. Koch, who found that, after having led an uninterrupted saprophytic existence for eight years, cultures of tubercle bacilli, under his observation, remain the same, save for a very slight diminution of virulence. What he failed, however, to accomplish by his own efforts chance all at once put in his way and furnished him with what was apparently an attenuated tubercle bacillus. Among a large number of tubes on his thermostat, in January, 1890, Dr. Trudeau noticed that in several, all having the same origin (the lesions of a guinea pig caused by the scrapings of an old phthisical cavity), a marked cultural variation had appeared. This he ascribed at first to contamination, but careful double staining proved the cultures to be pure. These tubes were presented, in April and May, 1890, to the New York Patho-

logical Society and to the Association of American Physicians, describing at that time their biological peculiarities, which consisted in a well-defined and constant cultural variation and in a great diminution of natural virulence. Rabbits inoculated subcutaneously with these cultures present after four months only an indolent localized lesion at the site of injection and no visceral disease. The cheesy abscess thus caused often grows to great size, and shows no tendency to open externally; as time goes on, it generally loses its cheesy character, becomes gelatinous in appearance, and tends often slowly to disappear, the animal still continuing free from visceral disease. Intrapulmonary injections of small amounts produce in rabbits a localized tubercular process, with little tendency to spread, or spreading very slowly in rare cases, and which is often entirely recovered from. Intravenous injection of moderate amounts of this attenuated germ gives rise to no appreciable disease, while intraperitoneal inoculation of large quantities is usually fatal. In guinea-pigs tuberculosis, running a very slow course, is brought about by all the above methods of inoculation, except by subcutaneous injection, which generally results only in a localized cheesy abscess similar to that caused in rabbits, but showing a much greater tendency to open and discharge itself externally. Whether this attenuation was due to the origin of these bacilli, or to the varied conditions of their surroundings while under cultivation through many generations, it is impossible at present to determine; but these constant cultural peculiarities and their enfeebled virulence seemed to warrant the assumption that the microbes in question were an attenuation of the tubercle bacillus, and these cultures were, therefore, used in the following experiments to produce a mild and localized form of the disease, and determine whether they would afford protection against a subsequent virulent inoculation.

SERIES II.—*Experiment A.—Inoculation of Living Virus.*—Four guinea-pigs were injected under the skin of belly with an old liquid culture (A) of the above described attenuated bacilli in glycerin-peptone bouillon, and a week later again with a fresher culture (B) of a month's growth, just taken from the thermostat, where it had been grown at irregular temperatures, ranging from 34° to 44° C. Plants of both sets of cultures—A and B—in fresh bouillon, showed six weeks later abundant growth from Culture B, and from Culture A in only one of the three tubes planted. The animals were kept five weeks, when they appeared in excellent condition, but all presented a small unopened abscess at the site of the second preventive inoculation, without any enlargement of the lymphatic glands. Two of them (Lot A) were then, together with two fresh animals as controls (Lot B), injected under the skin of belly with ½ c.c. of a virulent culture of the tubercle bacillus suspended in distilled water, while the remaining two animals (Lot C), which had been subjected to the protective treatment alone, were kept to determine the effects of the attenuated culture. All the animals were killed six weeks later. The results were as follows:

Lot C (simply subjected to protective treatment).—Both guinea-pigs present a small ulceration where the attenuated culture has been injected; in the first animal the spleen is a little enlarged, and two gray tubercles are visible in the right lung; in the second animal all the organs are perfectly normal.

Lot B (controls).—Both animals are markedly tubercular and present ulcerated cheesy abscesses, cheesy inguinal, mesenteric, and bronchial glands, very large tubercular spleens, and young tubercles scattered through liver and lungs.

Lot A (having undergone preventive and subsequent virulent inoculation).—Both animals are profoundly tubercular, perhaps a trifle more so than the controls whose autopsies are briefly recorded above.

SERIES II.—*Experiment B.*—This experiment was a repetition of the last one, only the protective inoculations were made with surface cultures of the attenuated bacillus grown on glycerin-peptone agar, instead of liquid cultures, as in Experiment A, Series II. The first preventive inoculation was made on six guinea-pigs with an old surface culture four months out of thermostat; the second, a week later, which a fresh one grown at irregular temperatures from 34° to 44° C., and whose viability was proved by plants on fresh culture media. After having been kept five weeks, the animals showed very trifling indurated spots at the site of injection, and were apparently in good health. Two of them (Lot A) were kept to control the preventive inoculation; and the four others (Lot B), together with four fresh controls (Lot C), were injected under the skin of abdomen with a suspension of virulent tubercle bacilli in distilled water. Six weeks later all the animals were killed.

Results.—Lot A.—Simply subjected to protective inoculation. One animal presents a small, open ulceration at the site of vaccination, with one slightly enlarged inguinal

gland; all the organs in both animals are perfectly healthy.

Lot B (controls).—All markedly tubercular, cheesy abscesses, cheesy glands, spleen, liver, and lungs riddled with tubercle.

Lot C (injected first with attenuated and subsequently with virulent cultures).—All tubercular; one only moderate, the other three are more extensively diseased than the controls.

SERIES II.—*Experiment C.*—This experiment was merely a repetition of the last two,—A and B, Series II.,—and was made for purposes of confirmation and control. Sixteen rabbits were used; ten (Lot A) were injected twice, at intervals of seven days, with a fresh surface culture of the attenuated bacillus grown at a constant temperature of 37° C. At the expiration of four weeks they presented prominent abscesses at the site of injection, but were otherwise in good condition. They were then, together with six controls, inoculated in the vein of the ear with 1 c.c. of virulent tubercle bacilli suspended in distilled water. Eight weeks later they were all killed within a few days of each other. The animals who had undergone preventive inoculation (Lot A) all had large, indolent abscesses at site of injection with the attenuated material. When killed, all the rabbits present the lesions of miliary tuberculosis of the lungs in varying stages of development; the other organs are sound. Both lots are about equally tubercular.

Summary of Experiments. — Results.— In Series I. preventive inoculation of the non-living chemical products of the life history of the tubercle bacillus failed, when applied, as above described, to afford any protection against subsequent infection with virulent living tubercle bacilli.

In Series II. preventive inoculation with an attenuated but living germ, capable of producing in most cases only an indolent and localized tubercular process at the site of injection, failed to protect against subsequent inoculations with virulent tubercle bacilli. No immunity seems to have been conferred by a saturation of the system which the chemical substances evolved by the microbes during their growth in artificial culture media, or by the production of a mild form of the disease. It must not be forgotten, however, that the methods of preventive inoculation which have formed the ground work of this study are merely tentative and in a field in which we can as yet but grope our way. They may seem crude even now, and, in the light of our rapidly-advancing knowledge on this subject, they will soon appear even more so than at present. Nevertheless, merely as a biological study of the tubercle bacillus, these observations seem perhaps worthy of record, and we may, in spite of the unpromising evidence which they have brought forth, turn to the brilliant announcements recently published, with a strong hope that the resources of foreign laboratories, or the individual efforts of some earnest worker, are about to solve the problem of protective inoculation for this disease, even if the genius of Koch, reaching out along new lines, has not already succeeded in producing a specific treatment for the cure of tuberculosis.

THE CURABILITY OF ACUTE PHTHISIS.

The term acute phthisis is frequently used in a very vague manner, and is applied to cases which have no title whatever to the appellation, as any one can very readily satisfy himself by the perusal of the medical journals. In a paper delivered before the Western Infirmary of Glasgow, PROFESSOR MCCALL ANDERSON describes the cases of acute phthisis which he believes to be curable, not cases merely of a short duration, nor chronic phthisis associated with more or less fever, nor those which, while running their course, suddenly develop acute symptoms, but cases of phthisis setting in suddenly, with high and continuous fever, great prostration, and profound involvement of the system, reminding one rather of typhus or a severe attack of typhoid fever than of a pulmonary affection. Indeed, in some instances it may be necessary to watch the course of the disease for some days before an absolute diagnosis can be made, so that the term "galloping consumption," used by many of our leading authorities, although not a scientific one, conveys to the mind a most accurate impression of the kind of disease with which we are dealing.

Such cases are comparatively rare, and are only exceptionally met with in hospital practice; not only on this account, but because the patients are supposed to be too ill to be removed, or, if removed, they are fully as likely to find their way into a fever as into a general hospital.

There are two forms of acute phthisis,—(*a*) acute tuberculosis and (*b*) acute pneumonic phthisis.

In acute tuberculosis tubercles are more or less copiously disseminated throughout the lungs, and often also in other organs. But

the symptoms of acute phthisis do not appear unless or until these foreign bodies produce congestion or inflammation of the pulmonary tissues, and, if the patient lives long enough, breaking down of the lung-tissue may occur here and there, with the development of small excavations. That the infiltration of the lung with tubercles does not necessarily lead to acute phthisis is proved by the occasional discovery, post-mortem, of obsolete tubercles scattered through the lungs in the case of those who never experienced pulmonary symptoms during life.

In acute pneumonic phthisis the disease exhibits almost from the first a more or less extensive consolidation, most frequently of the upper lobes, which often spreads to other parts, and, instead of resolving in a week, like a croupous pneumonia, leads to rapid and wide-spread destruction of lung-tissue, which soon terminates the life of the patient.

A perusal of the literature of the subject leads to the opinion that the authorities are very hopeless in regard to the prospects of sufferers from this disease, and, while Dr. Anderson states that he has read numerous records of fatal cases, he has never met a carefully recorded case fulfilling the definition of acute phthisis, as he understands it, in which a complete restoration to health occurred; and, while many hold that acute tuberculosis is the more certainly fatal of the two, Dr. Anderson is rather inclined to the opinion that acute pneumonic phthisis is probably the more dangerous, as it leads to such rapid and wide-spread destruction of pulmonary tissue.

Dr. Anderson states that he has notes of seven cases, all of which were treated in a similar manner, and that of the seven, five recovered. Of the two fatal cases, one was beyond the reach of recovery when he came under observation, his lungs being extensively disorganized, while in the other instance the fatal issue was due to the complication of perforation of the lung. The author maintains in the most positive manner that, if acute phthisis is treated early and energetically, the prognosis is far from gloomy. The following is an outline of the kind of treatment upon which, according to Dr. Anderson, reliance may be placed, although, of course, no two cases can be treated exactly in the same way. Each patient and his surroundings must be specially studied before deciding on the line of action.

The principal indications are—1, to keep up the strength; 2, to keep down the fever; and, 3, to treat any special symptom or complication which may arise.

1. Two thoroughly trained and reliable nurses are indispensable, one for day and the other for night duty; for without admirable nursing no hope of improvement can be entertained; and the hygienic and other surroundings of the patient should be satisfactory, so that we need not be surprised that, when the disease occurs in the homes of the working-classes, it is almost necessarily fatal, and that hospital patients have the best chance of recovery. The patient must be fed constantly on fluid food (soup being avoided if diarrhœa is present) both day and night, and stimulants (from ℥ii to ℥x) are required early in the attack, but should be given in small quantities, frequently repeated, and along with the food. In fact, the dietetic treatment should correspond with that of a case of fever, presenting symptoms of a similar degree of severity.

2. At bedtime a subcutaneous injection of sulphate of atropine (grain $\frac{1}{100}$ to grain $\frac{1}{60}$) is given. This checks perspiration when present, acts as a sedative to the system, indirectly helps to reduce the fever, and diminishes the secretion from the lungs.

3. Remedies are given with the view of lowering the temperature. This is a point of the utmost consequence, because the majority of the patients die consumed by the fever. Some benefit is derived by allowing the sufferer to suck ice freely, by giving the food and drinks iced, by sponging the body with iced vinegar and water, or even by using iced enemata. But Dr. Anderson's main reliance is upon one or more of the following methods:

a. Niemeyer's antipyretic pill or powder every four hours, containing grain 1 quinine, grain ½ to grain 1 digitalis, and grain ¼ to grain ½ opium. The proportion of opium may even have to be increased beyond this if there is much diarrhœa. The effect of the digitalis must be carefully watched, and it must be omitted for a time if the pulse becomes preternaturally slow and irregular and the secretion of urine very scanty.

b. The administration daily—particularly shortly before the temperature tends to be highest—of from 10 to 30 grains of quinine, given, as suggested by Liebermeister, either in a single dose or, at all events, within an hour.

c. The application of iced cloths to the abdomen for half an hour every two hours so long as the temperature exceeds 100°. The application of iced cloths is made in this way:

The night-dress is pulled well up over the chest, so as to avoid any possibility of its being wet, and, for a similar reason, a folded blanket is placed across the bed under the patient's body. The usual bed-clothes are arranged so that they reach up to the lower part of the chest only, which latter is covered by a separate blanket in order to prevent unnecessary exposure while the cloths are being changed. Two pieces of flannel are employed, each being sufficiently large when folded into four layers to cover the whole of the front and sides of the abdomen. One of these, wrung out of iced water and covered with a piece of dry flannel to protect the bed-clothes, is applied, while the other is lying in a tub of iced water at the side of the bed. The pieces of flannel are changed every minute, or so often that they still feel cold when they are removed. The changing of the flannel, particularly when two persons are in attendance,—one to remove the bed clothes and the flannel, the other to apply the piece which is freshly iced,—can be accomplished in a few seconds.

THE TREATMENT OF HÆMOPTYSIS.

In the Harveian Oration for this year, DR. ANDREW calls attention to certain most important considerations of intravascular pressure; more particularly he refers to the work of Dr. Bradford and Mr. Dean on the pulmonary circulation. There can be no doubt that the comparative independence of the two circulations—the pulmonary and systemic—has been generally overlooked, and that it has been assumed without evidence that those means which are capable of influencing the systemic circulation will act similarly upon the pulmonary. The recent physiological work above referred to has shown the presence of a pulmonary vaso motor system, which, though apparently less developed than the corresponding systemic mechanism, is capable of exercising a decided control upon the flow of blood through the lungs; it has further shown that great pressure changes may occur within the systemic vessels without corresponding changes in the pulmonary blood-pressure. Clearly it is necessary to review the situation of vascular therapeutics from the stand-point of this latest advance. Dr. Andrew next gives the results of experiments by Dr. Lauder Brunton, and of others by Dr. Bokenham, in which the influence of various drugs was brought to bear on the circulation generally. These experiments confirmed the results of the above investigators, showing, as they did, oscillations in blood-pressure in the two circuits, which, at least in their time relations, were independent of each other. At the close of the oration, Dr. Andrew draws one conclusion, which, on account of its importance, must be quoted. He says, "If it be true, to use the statement in one of our best monographs on diseases of the lungs, that 'it is of great importance to relieve blood-pressure in hæmoptysis,' then aconite ought to be a much more efficient remedy for that affection than ergot."

This statement calls for most careful consideration, and has been made the basis of a note published by DR. H. SAINSBURY in the *Lancet* for November 8, 1890. In the first place, we may note that this claim for aconite as a means of arresting hæmoptysis is not made because of any different action upon the lung circulation from that with which we are familiar in the case of the greater circulation; for Dr. Andrew points out that aconite produces a fall in blood pressure in both the pulmonary and carotid arteries. If, then, aconite is to act thus upon the lungs as a hæmostatic, will it not act similarly upon the systemic tissues; and may not a more comprehensive statement be advanced,—viz., that in cases of hemorrhage generally, aconite, as a means of lowering blood-pressure, is indicated? In discussing this it will be best, for the sake of clearness, to deal with one circulation only,—*e.g.*, the systemic. What are the factors concerned in a bleeding? On the one hand, the rent in the vessel; on the other hand, the *plus* pressure within the vessel. This intravascular pressure is itself the product of two factors,—the action of the heart; the reaction or resistance of the vessels, and this resistance is greatest at the periphery of the arterial tree. Now, does not the whole question of the treatment of hemorrhage, viewed as a *mechanical problem*, turn upon the position of the rent in the vessel? Let us suppose this rent to be in some artery of large size, what will be the effect of giving a drug of the ergot or digitalis group? Clearly to force the blood out by the rent, since we impede its flow through the arterioles. As clearly it must appear that if any treatment is called for in such a case, it will be one which will lower blood-pressure and accelerate the production of syncope. But suppose now that the leakage takes place from the capillaries, an oozing on a large scale, what evidence have we that ergot or

digitalis, given in such a case will cause an increased pressure within the capillaries,—*i.e.*, at the bleeding-point? The rise of blood-pressure takes place between the arterioles and the heart, and it will not exceed, though it may fall short of, that which is requisite to force the blood through the contracted arteriole. Is not the evidence physiological and clinical to the effect that the arterioles may be starved by an excessive action of a drug of this class? and that such drug, therefore, is indicated in capillary hemorrhage?

Now, place the rent in the arteriole area, and what will ergot or digitalis effect? The blood-pressure will rise, it is true, but the bleeding vessel itself will contract. Whether under these circumstances bleeding will continue or be checked will depend upon the predominance of blood-pressure over contraction of the rent, or *vice versa*, and this will depend upon whether the rent is situated too near the heart or sufficiently near the capillaries. In this doubt we shall halt between the employment of means which favor syncope and those which raise blood-pressure by arteriole contraction. To pass to the lungs, may we not reason in the same way concerning the circulation through them, seeing that this circulation has now been shown to be under the control of a vaso motor system? Dr. Andrew urges that the effect of a given drug may not be the same, even qualitatively, on the lungs and on the systemic tissues, and he instances amyl nitrite, nitroglycerin, and muscarine as examples of such dissimilarity of action. But while the evidence in favor of this might be more conclusive, there is no such dissimilarity in the action of ergot or of digitalis upon the two circulations. Dr. Andrew states this explicitly. If, then, in hemorrhage from the systemic circulation we see indications at times for the use of ergot and digitalis, may we not look for benefit from their timely use in certain cases of pulmonary hemorrhage? Is not the main difficulty in the treatment of hæmoptysis the fact that we cannot look inside and see whether we are dealing with hemorrhage from a vessel of some size, very possibly from an aneurismal dilatation, or whether it is a capillary hemorrhage which we have to check? Until we are able more successfully to determine these points, it is to be feared that hæmostatic treatment will at its best prove random treatment; but even so, we are scarcely justified in discarding ergot and digitalis, because we cannot always select the cases for which they are indicated.

GUAIACUM AS A PURGATIVE.

In our thirst for new remedies there seems to be a danger that some of our good old-fashioned drugs will be forgotten. Guaiacum is an illustration of this, for in most of our text-books on therapeutics we are told simply that guiacum resin acts as "a stimulant, diaphoretic, and diuretic," although there is but little evidence in support of this view.

Dr. William Murrell, however, believes that its action is as a laxative or purgative, and in the *Medical Press* for November 5, 1890, he writes that his attention was drawn to the subject some two years ago by casually prescribing for a man suffering with rheumatism some guaiacum lozenges made up with black-currant paste. He continued taking them long after the pain had ceased, and his explanation was that they did him good by acting on the liver and bowels. As a consequence, Dr. Murrell ordered the lozenges for other of his patients suffering from constipation, and what is conventionally called "biliousness," and the result was equally satisfactory. He then had a confection prepared containing ten grains of guaiac resin to one drachm of honey, and this was curiously popular with his hospital patients, so that for the last two years he has used it extensively not only as a purgative but in chronic rheumatism, sciatica, tonsillitis, dysmenorrhœa, and allied affections. The confection is very disagreeable to the taste. At first he gave it in drachm doses once a day, but he found that his patients were not satisfied with this, and he had to increase the dose to a drachm three times a day. In this quantity, Dr. Murrell writes, "It seems capable of producing the maximum of inconvenience and discomfort, and gives unlimited satisfaction. The purgative effect is very pronounced, and in one case the patient had fifty-six evacuations in the week. In another case it produced a well-marked rash, covering the arms and legs with an eruption, which forcibly reminded one of copaiba. It was accompanied by intense itching, which disappeared on discontinuing the drug."

Dr. Murrell has found that guaiacum not unfrequently gives rise to a burning sensation in the throat, and to obviate this he prescribed ten grains of the resin in half an ounce of extract of malt, which answered admirably. Dr. Murrell believes that if the drug was triturated with cream of tartar, sugar of milk, or some other equally inert substance, its efficacy would be increased, and it would produce the desired effect in smaller doses.

THERAPEUTICS OF GASTRIC DYSPEPSIA.

M. GEORGES contributes (*Revue Médicale de l'Est*, September 1, 1890) a paper on this subject, based on a number of experiments he has made on the relative digestive powers of natural and artificial gastric juices. Cubes of hard-boiled white of egg were placed for a certain length of time in an artificial gastric juice containing HCl and pepsin in varying dilution. He finds—1. That to effect a speedy and satisfactory digestion of hard-boiled egg, or of roasted and raw meat, it is necessary to use a gastric juice containing a large quantity of HCl and a minimum quantity of pepsin. 2. The hydrochloric acid ought to be employed sufficiently dilute; a .4 per cent. dilution appears to be preferable to one either weaker or stronger, such as .1 per cent. to .2 per cent. or 1 per cent. 3. The best proportions of HCl (.4 per cent.) and pepsin are about five cubic centimetres of acid to two centigrammes of pepsin. 4. It is necessary to employ the artificial juice thus made in sufficient quantity to obtain the best result. Thus, if the above proportions of acid and pepsin be taken as the unit, it may be said that the digestive power of the juice increases with the quantity employed, and that the increase is in the proportion of 12 to 8. This only applies, however, within certain limits. A combination of forty cubic centimetres of a .4 per cent. solution of HCl with eight to ten centigrammes of pepsin gives the best results of all.

His observations on the digestive capabilities of natural gastric juice were made on one hundred and forty-two specimens taken from sixty-nine patients. In eight cases of "chlorotic anæmia" the contents of the stomach were found on eighteen occasions to have no digestive power at all; on two occasions they possessed a slight power; and on one occasion digestive power was normal. In each of these cases the addition of pepsin failed to modify the digestive action; in one instance, indeed, it appeared to delay it. The addition of HCl, on the contrary, had a very marked effect in twelve cases, but was without result in eight cases. Of all the degrees of dilution employed, .4 to .6 per cent. of HCl gave the best results. In nine cases of gastric ulcer the digestive power of the gastric juice was found to be excellent on nineteen occasions and absent altogether on ten. In these ten instances pepsin was found to be hurtful in its action on three occasions, while HCl (.4 per cent.) restored the digestive power on six occasions. Analogous results were obtained in ninety-two specimens of gastric juice obtained from fifty-two different cases, including such affections as tabes, catarrhal jaundice, acute and chronic gastritis. In eighty-seven of these ninety-two the gastric juice was without digestive power. The addition of HCl (.4 per cent.) proved useful in forty-six cases, while pepsin entirely failed, even impeding the digestive process, on twelve occasions. The result, therefore, of the observations on one hundred and forty-two samples of gastric juice was that one hundred and fifteen were found without digestive power. In all these cases pepsin had no action, appearing sometimes to be even hurtful (sixteen times). The conclusion he draws from these data seems, then, justified,—namely, that pepsin is useless where the dyspepsia is due to some primary or secondary disturbance in the gastric secretion, while hydrochloric acid can be used with advantage in such cases. A further series of observations on the digestive power possessed by various medicinal preparations containing as their basis hydrochloric acid, pepsin, pancreatin, or papaïn, showed that they were without action in all cases; they did not facilitate digestion either in the case of artificial or of natural gastric juice.—*British Medical Journal*, October 25, 1890.

A CASE OF TETANUS TREATED WITH ESERINE.

DR. GEORGE H. LEE reports in the *New Orleans Medical and Surgical Journal*, October, 1890, the case of a married woman, aged 23, in whom marked tetanus resulted nine days after abortion. At this time there developed the stiffness in the muscles of the jaws, which spread to other muscles and increased in degree until the jaws were tightly fastened together, and she was continually in a condition of opisthotonos. The peculiar risus sardonicus was marked, and every few minutes, upon the slightest irritation of any kind, the most violent muscular contractions occurred. Her tongue was lacerated, swollen, and bleeding from being caught between her teeth. Temperature, 100.8°; pulse, 110. There was a discharge from the vagina, which had a very disagreeable odor. For several days all her nourishment had to be administered through a tube by means of a space left by a lost incisor. Morphine was given hypodermically in doses of ⅓ to ½ grain, and produced temporary and partial

stupor, but at no time was there any relief of the tetanic contractions aside from what could be traced to the blunting of the sensory nerves, and thus the lessening of external irritation. Eserine was administered hypodermically the first day, consisting of $\frac{1}{20}$ to $\frac{1}{12}$ grain, little effect being noticed; hydrate of chloral, 1 drachm, 25 minims tincture of gelsemium, and 15 minims of tincture digitalis were given by the mouth, and afforded some relief. The dose of eserine was then gradually increased up to $\frac{1}{8}$ grain, then $\frac{1}{2}$ grain, repeated every four hours, until on one day one grain of eserine was administered and four grains of morphine. It was noted that where the dose of eserine was sufficient to produce its characteristic effects, it thoroughly and promptly relieved the rigid convulsive symptoms and likewise the pain. It is also of interest to note that, with the subsidence of the tetanic symptoms, the tolerance of eserine disappeared, so that fifteen or twenty minutes after the administration of eserine she developed symptoms of the most decided collapse, marked prostration (so as to render active stimulation necessary), with nausea, vomiting, and purging, closely resembling cholera morbus. During the height of the tetanic condition the patient was anæsthetized, and the vagina thoroughly douched with a mercuric chloride solution, 1 to 2000, the os and cervix widely dilated, and the uterine cavity scraped out with a blunt curette, and washed out with the hot 1 to 2000 solution, followed by a 1 to 6000 solution same salt. The patient had commenced to improve before this washing out of the uterine cavity was practised, but after this the improvement continued and was more decided. One hundred and forty-nine hypodermic injections in all were administered, and there was never the least inflammation produced. Perfect recovery took place, although for some time after the tetanic attacks had ceased risus sardonicus was present, which finally subsided under hot injections. A few lymphatics of the neck were enlarged.

THE TREATMENT OF WHOOPING-COUGH BY VACCINATION.

Dr. Cachazo noted in a case of whooping-cough under his care that almost immediately after vaccination there was a striking relief in the whooping-cough, and this observation led him to test the action of the vaccine virus in five extremely severe cases of whooping-cough, and his results are published in the *Wiener Medisinische Blätter*, October 16, 1890. Of these five cases four were of such extreme severity as to threaten life. The convulsive attacks were almost continuous, and were accompanied by threatening suffocation from vomiting and bleeding from the mouth and nose. Dr. Cachazo vaccinated each of these cases, and, as soon as the febrile symptoms of the vaccination commenced, the situation was entirely altered. The coughing almost entirely ceased, and was then simply of a catarrhal character, and disappeared entirely after eight or ten days. During the existence of the vaccine disease the patients were treated with inhalations of one per cent. carbolic acid solution, a procedure which, he thinks, is warranted, on account of the observation of Theile, that the microbes in this disease do not exist deep in the mucous membrane, but are superficially located in the mucus, so that the antiseptic readily reaches them and causes their death.

As regards the mode of action of the vaccine microbe, the author has very little definite to suggest. He calls attention to the two possibilities that either the febrile symptoms in vaccination are due to the distribution through the body of the vaccine microbes, or that the action of these microbes terminates in the development of certain products which themselves produce the characteristic effects of vaccination. But as to how the whooping-cough is affected he has nothing to suggest.

THE RELATION OF NASO-PHARYNGEAL DISEASE TO CATARRH OF THE MIDDLE EAR.

At the meeting of the American Rhinological Association, held at Louisville, Ky., October 6, 7, and 8, 1890 (*New York Medical Record*, October 25, 1890), Dr. Emmett Welsh, of Grand Rapids, Mich., contributed a paper on this subject. He said the relationship existing between naso-pharyngeal disease and catarrh of the middle ear was intimate and inseparable. The ear depended upon a healthy condition of the nares and naso-pharynx for the healthy performance of its function. Patients presenting themselves for the treatment of ear-diseases always give the story of catarrh, located in the nose and throat, and date their primary impairment to this condition; therefore it becomes essential to not only become familiar with the speculum,

the rhinoscopic mirror, the catheter, Politzer bag, etc., but also to detect the diseases of the nares and naso-pharynx, its inflammations, obstructive lesions, and measures for their removal.

The existence of a spur upon the septum may be the means of exciting a tinnitus aurium, and how useless direct medication to the ear would be without its removal. It would be erroneous for the rhinologist to ignore the large number of aural complications he meets with in daily practice. This is very apparent, indeed, when we consider that the larger proportion of abnormal changes that take place in the ear result from those diseases of the naso-pharynx which produce narrowing or obstruction of the Eustachian tube.

Repeated attacks of subacute otitis media can be found in cases directly referable to some mechanical obstruction or inflammatory condition of the naso-pharynx. Its relief is dependent upon this causation, and its treatment plain; yet how often do we find that this is not detected, and the uselessness of direct medication to the ear patent.

This is best illustrated in cases of children, who, suffering from recurrent attacks of otitis media, are presented for examination and treatment; when on inspection, the membrana tympani is found inflamed, the child suffering from difficulty in breathing, and mouth-breathing predominating, the nares inflamed, and an adenomatous growth existing at the vault of the pharynx.

All treatment with a view to correcting the inflammation of the ear is useless, and the only plan is medication of the nares and the naso-pharynx.

THE TREATMENT OF LEG ULCERS BY THE ITALIAN AUTOPLASTIC METHOD.

Professor Paul Berger recently presented before the French Academy of Medicine two patients whom he had cured of leg ulcers, which had resisted every other mode of treatment, by the Italian autoplastic method (*La France Médicale*, October 17, 1890). In one of these patients the ulcer, probably of syphilitic origin, was circular; the retraction of the subcutaneous tissues caused interference with the circulation in the lower third of the leg, and so caused persistent œdema of the foot, trophic alterations in the skin and contractions causing permanent flexion of the toes and immobility of the foot and ankle-joints. Amputation appeared to be the only feasible operation, but after four successive operations, continued for eighteen months, Dr. Berger was able to entirely renew the normal integuments throughout the entire circumference of the leg, and the ulcer was cured by transplantation of four large cutaneous grafts provided with their cellular tissue, and removed from the thigh on the same and on the opposite side and from the leg. The pedicle of these grafts was only divided on the twenty-first day. Trophic troubles of the feet and the affections of the joints were overcome, and the part was then quite restored to its normal condition.

Dr. Berger insists that the object to be fulfilled by such transplantation of cutaneous grafts was not only to obtain a firm cicatrix, but to provide normal integument with cellular tissue, so as to do away with the adhesion of the scar to the parts below. In this way cicatricial retraction not only of the ulcer, but of the parts below, and its consequences, is obviated and renders possible the excision not only of the ulcer but of the parts upon which it rests. The author claims that neither the transplantation method of Reverdin nor that of Thiersch gives comparable results, but that for the Italian method of grafting to be successful it is necessary that the limb from which the graft be taken be itself healthy, and that the general condition of the patient itself be good. The operation best succeeds in young subjects, but is of little value in true varicose ulcers.

The second patient had incurable ulcers on both legs in the centre of an extensive contracted cicatrix from burns. Dr. Berger also cured this case by transplanting a portion of skin from the thigh of the corresponding side, the leg being maintained in forced flexion until adhesion was well established when the pedicle of the graft with the original seat on the thigh was divided; the result was perfectly satisfactory: the author states that the opposite leg will shortly be operated on in the same manner.

THE THERAPEUTICS OF EXOPHTHALMIC GOITRE.

At the meeting of the New York State Medical Association, held October 22, 23, and 24, 1890, Dr. E. D. Ferguson, of Rensselaer County, read a paper with this title. Exophthalmic goitre, he said, was not a common disease, and yet it was not so rare as to render it a curiosity. Though the disease was one with sufficiently well-defined characteris-

tics to allow of its ready recognition, still errors of diagnosis might, and doubtless did, occur. The fact was that enlargement of the thyroid body was not peculiar to the disease, and that a frequent pulse was attendant on a multitude of morbid conditions, and occasional prominence of the eyes might be added from causes not the same as the condition determining the development of exophthalmic goitre. The conclusion that the condition was not at any rate a pathological unit had been strengthened, in the judgment of the writer, by the results of the use of digitalis, for in every instance in which he had felt confident of the diagnosis that drug had not only failed to afford relief, but was apparently productive of injury. The writer then gave in detail the histories of several cases of exophthalmic goitre treated with strophanthus. The administration of this had afforded prompt relief, the patients being able to return to their ordinary occupation. In no instance had either the exophthalmia or the goitre been entirely removed, and, so far as the latter was concerned, the author would not expect its removal, for when the enlargement had existed for some time it became of so dense or fibrous a consistence as to preclude the idea of its complete removal. There was, however, a notable degree of improvement both in the exophthalmia and in the thyroid body, but it was impossible to express in mathematical terms the changes in these features of the disease so well as could be done in the rate of the pulse. Not only were the rate and rhythm of the contractions favorably influenced, but in these cases there undoubtedly existed a dilatation of the left ventricle, which improved so as to leave no physical or symptomatic evidence of cardiac lesion. Recent pathological considerations tended to place exophthalmic goitre in the category of the neuroses, and the locus of its origin in the floor of the fourth ventricle. Still, the evidence was not such as to give any clew concerning its etiology or treatment, aside from clinical observations, and consequently there was no explanation to offer as to the method by which strophanthus afforded relief, aside from the idea that first suggested its use, and that was to relieve an apparently overtaxed heart through the lessening of the resistance in the systemic circulation which was alleged to be its action. Aside from any theoretical consideration as to the way in which the agent acted, the fact remained that benefit was apparently the direct result of the use of strophanthus,—a benefit so notable as to almost justify the announcement of a cure in some of the cases. The only preparation used by the writer was the tincture, given by the mouth, three times daily at each meal, the initial dose being from 8 to 10 drops, which was increased, if necessary to reduce the frequency of the pulse, to 15 or 20, or even 25 drops. Whether its apparent utility would bear the test of time and larger experience was still problematical. At present it seemed to be our most valuable therapeutic resource in exophthalmic goitre. —*New York Medical Journal*, November 8, 1890.

THE PHARMACOLOGY OF CHLORALAMIDE.

In the graduation thesis of St. Petersburg, 1890, DR. MALACEOWSKY reports a number of experiments which he has made on cold-blooded and warm-blooded animals to determine the physiological action of chloralamide (*Les Nouveaux Remèdes*, October 24, 1890). He employed for his experiments a five per cent. watery solution, which he administered by means of subcutaneous injections and by way of the mouth. The following are the results he noted after the administration in cold-blooded animals of ⅓ to ¾ grain:

1. Immobility and disturbed co-ordination attributable to cerebral lesion.

2. Diminution and abolition of reflexes attributable to action on reflex centres of the spinal cord.

3. Slowing and finally arrest of the respiration, probably of central origin, since both the respiratory nerves and muscles retain their normal excitability.

4. Slowing and arrest of the heart, in consequence of stimulation of the peripheral inhibitory apparatus.

5. In the last stages of poisoning there occurs paralysis of the motor apparatus and the cardiac muscle.

Given in doses of 11 to 15 grains chloralamide produces death in the frog within a few minutes. As regards the results obtained on warm-blooded animals, the effects of the administration of a five per cent. solution of chloralamide are summarized by the author as follows, as expressing the results of sixty-five experiments made on dogs and rabbits:

1. Chloralamide produces sleep as the result of its action on the brain.

2. It diminishes the excitability of the brain.

3. It diminishes the excitability of the spinal cord.

4. It prevents the production of co-ordinated movements by its action as a depressant on the central nervous system.

5. The interference with the production of reflexes is attributable to its action on the reflex centres.

6. It lowers blood pressure through paralysis of the vaso-motor centre.

7. It reduces the frequency of the pulsation of the heart through action on the cardiac inhibitory centre.

8. It reduces temperature, and this is due partly to the increase in heat-dissipation and partly to the diminution in heat-production.

9. It produces various forms of functional disturbance in the gastro-intestinal apparatus of the dog.

TREATMENT OF INFLAMMATION OF THE VERMIFORM APPENDIX.

According to the Paris correspondent to the *Medical Press and Circular* for October 29, 1890, M. BERGER introduced before the Société de Chirurgie the subject of ileo-cæcal inflammation, the diagnosis of which, he said, was often uncertain. He had observed several cases during the course of the year of perityphlitis. These were operated on and died. The only one which was not surgically treated got well. In one case the patient was brought to the hospital evidently suffering from peritonitis due to perforation. The abdomen was greatly distended, the fæces abdominal, the extremities cold, and the pulse imperceptible. In spite of the critical and hopeless condition of the man, M. Berger determined to perform laparotomy. When the abdomen was opened, a quantity of liquid of an opaque color flowed out, and on passing the hand towards the right iliac fossa the vermiform appendix was found to be swollen and evidently inflamed. When drawn forward a perforation was discovered at its point. The man succumbed a few minutes after the operation. Another case was that of a boy of 16, who, in going to his work one morning was seized with violent pain in the right iliac fossa. Brought home, a doctor diagnosticated peritonitis from intestinal occlusion. His condition not improving from treatment, M. Berger was sent for, who found the lad in a very grave condition. Besides the symptoms met with in the first case there was vomiting of something like fæcal matter. An operation was decided upon without delay, as strangury was suspected. The incision was that for ligature of the external iliac artery, and a large collection of pus was discovered in front of the cæcum. When the appendix was brought to view a stercoral calculus was found to occupy its middle third. Above this obstacle was a perforation of the size of a lentil. The patient succumbed on the following day. In conclusion, M. Berger said that it was clinically impossible to diagnosticate between perityphlitis and inflammation of the appendix, but M. Roux, of Lausanne, in an important work on inflammation of the appendix, believes it possible to diagnosticate perforation of that part from simple inflammation. In the former, he says, the pain comes suddenly, like a pistol-shot in the right iliac fossa, the peritonitis follows immediately the first symptom, and a tumor of about the shape of the vermiform appendix. As to the conduct to be observed in such cases, M. Berger said that no hesitation should be made where perforation was suspected. M. Richelot said that rapid intervention was necessary, and that in the case of a woman the diagnosis was especially difficult.

TRANSPLANTATION OF MUCOUS MEMBRANE.

DR. E. DJATSCHENKO concludes his experimental investigation as to the condition in which transplantation of mucous membrane is advisable by the following conclusions, which have marked practical value to the surgeon (*Internationale Klinische Rundschau*, October 26, 1890):

1. The transplanted fragment must be closely applied to the surface to which it is desired that it shall adhere, and bleeding must be absolutely arrested, and all coagulated blood entirely removed before the transplanted piece is applied.

2. Before transplantation, the piece of mucous membrane must be washed in sterilized one-half per cent. salt solution at a temperature about 99° F. No unfavorable effects are produced even should the piece lie in this solution for an hour and a half.

3. All adipose tissue must be carefully removed with the scissors from the lower half of the transplanted fragment, and the entire submucous cellular tissue must not be cut away, otherwise the conditions for the restoration of the circulation of the transplanted fragment will be unfavorable.

4. Although the transplantation must be performed in an aseptic condition, the stronger disinfectants cannot be used either on the

excised fragment or on the surface on which transplantation shall take place.

5. The transplanted fragment must exactly fit the surface on which it is applied in order to prevent the production of a cicatrix.

6. The transplanted fragment must be carefully protected from drying.

PHOSPHORUS AND RICKETS.

According to the Berlin correspondent to the *Medical Press and Circular* for October 22, 1890, DR. MANDELSTAMM has lately published in Wracz his observations on the treatment of rickets by small doses of phosphorus. He points out—what, indeed, is well known—that the views of clinicists are still very divergent as regards the utility of this method of treatment. Some, and among them may be mentioned Monti, Lorey, Henoch, and Baginsky, deny that it has any action at all, and even affirm that it is injurious. Others, again, such as Kassowitz, Bohn, Förster, and Soltmann, declare that phosphorus is the best remedy we possess for rickets. Careful clinical observation on the subject is, therefore, a matter of great importance. The author's observations extend to two hundred and sixteen cases, of ages varying from 3 months to 3 years, in addition to eighty other cases, where the affection was so mild as to be easily overcome by other means. The phosphorus was given in doses of .005 to .001 gramme per diem, dissolved in almond oil, and continued for from a month to a year. Of the two hundred and sixteen thus treated, complete recovery took place in one hundred and twenty, forty-three were considerably improved, in thirty no result followed, and in twenty-three the treatment had to be discontinued, owing to the intercurrence of other disease. Assuming that rickets was a general disease, the author observed not only the bony system, but also growth and weight of the body, and the measurements of the head and chest. As the whole of the cases were furnished by the poorer classes, the author claims that, considering the deficiency in the hygienic and dietetic relations, the improvement may be fairly accredited to the phosphorus. The author claims, as the result of his observations, that the following theses are established: 1. That clinical observation fully justifies the employment of phosphorus in rickets. 2. That it acts better and more rapidly than other remedies. 3. Children bear small doses of phosphorus for long periods without injurious consequences. 4. The remedy is acknowledged to act beneficially on the nervous accompaniments of rickets, and contributes to the improvement of the general health. Periodic measurements and weighing of the children treated by phosphorus, as well as the osseous system, show that this treatment in the majority of cases leads to recovery.

While on the subject it may be well to turn to another contribution to the subject of rickets in the *Kinder Arzt*, May, 1890, by DR. TEDESCHI, Padua. The writer attributes the disease to certain centres of the nervous system, and he had been led by his views to treat the disease by galvanization of the medulla spinalis. After treating one hundred and seventy-four cases by his method, and forty-nine simultaneously by the phosphorus method, he makes a comparison of the two series, and comes to the following conclusions: Phosphorus is generally not well borne; rapid action in the ossification of the skull and the other bony affections has not been proved; the undeniable beneficial action of phosphorus when it can be borne is due to improvement in the general and nervous condition of the patient; after galvanization the night-sweats disappeared after three or four applications, and sleeplessness became less; in most cases the laryngeal spasm quickly disappeared, and the pain in the bones disappeared at the same time. It could not be shown, however, that the thickening of the epiphyses became less under the influence of the galvanic treatment.

THE TREATMENT OF INFANTILE DIARRHŒA WITH STERILIZED MILK.

In a paper read before the Société Médicale des Hôpitaux for October 10, 1890, DR. COMBY read a paper on the "Treatment of Infantile Diarrhœa by Means of Sterilized Milk" (*La Médecine Moderne*, October 10, 1890). Dr. Comby stated that in Paris the number of deaths from infantile diarrhœa may be safely estimated at four thousand yearly, and that these deaths are not only dependent upon variations in temperature, but are much more abundant among the poorer classes, a fact which is dependent not only upon unhygienic surroundings, but especially upon a premature feeding of young children, and with poor quality of milk employed in artificial feeding. Dr. Comby states that he has in the dispensary with which he is connected occasion to see a large number of children affected with diarrhœa, and he has undertaken their treat-

ment by simply prohibiting the vicious qualities of their alimentation. This he has accomplished by feeding them exclusively with sterilized milk. The results, he states, have been in the highest degree satisfactory. Fifty-six children, from 1 to 2 years of age, affected with diarrhœa, in the majority of cases of a fairly severe character, were treated solely by this mode of alimentation, and, with the exception of twelve, who did not return after the first visit, forty-four were observed, of whom thirty were cured in a few days and fourteen greatly improved. The preparation of this milk constitutes a special business in Paris, and although the precise method of sterilization is guarded as a secret, there yet seems to be no doubt that it consists in the method commonly employed elsewhere in boiling the milk in a steam bath, and then hermetically sealing the flasks, which so prepared may be kept for several months. In Paris, as in the majority of other large cities, it is difficult to obtain fresh cow's milk of good quality and perfectly aseptic. By the use of sterilization any fair sample of milk may be used almost with perfect confidence if previously sterilized before being administered.

In the discussion which followed the reading of Dr. Comby's paper, Dr. Ollivier made the statement that while there was no doubt that sterilized milk was to be regarded as a great advance in alimentation, yet most of the specimens of sterilized milk on the market were loaded with substances with the idea of preserving it from decomposition, and that such substances might in themselves prove very serious menaces to the patients, while in addition its expense, which was nearly one hundred per cent. greater than fresh milk, was an objection to its general employment.

It seems that the numerous cheap apparatus which we use so much for sterilizing milk for family use are unknown in Paris.

HYDATID TUMORS.

At the meeting of the Canadian Medical Association, held September 9, 10, and 11, 1890 (*New York Medical Record*, October 25, 1890), Dr. H. H. Chown, of Winnipeg, after referring to the origin and formation of these growths from the larval stage to their development in the form of tumors, found sometimes in the liver, peritoneum, brain, lungs, or in the muscles, described the further development of the cyst and its contents. The heads of tænia echinococcus are found in the various stages of development, and were often sufficiently numerous to render turbid the usually clear fluid contents. These growths gave rise to a variety of symptoms, varying according to the position and size of the tumor. For example, if in the liver, we have jaundice, ascites, anasarca, œdema, varicose veins, or paroxysmal pains; if in the lungs, cough, dyspnœa, or hæmoptysis; if in the abdomen, vomiting is a prominent symptom, with pain after each meal. Change was continually going on in these cysts, and either calcareous degeneration, absorption of fluid, or suppuration might occur. Cases are reported where rupture took place into the intestine, the bronchi, bladder, uterus, and into the peritoneal cavity. An exploratory operation was the only means by which a positively correct diagnosis could be made. Microscopical examination of the fluid aided in distinguishing the contents from urine and other fluids. Dr. Chown concluded his interesting paper by describing the different methods of treatment. These were: 1, electrolysis; 2, puncture and drainage; 3, incision; and, 4, excision. The second method was the one most commonly employed, and by it, the contents being expelled, the cyst collapses and absorption is rapidly set up. Success generally followed this method of treatment, which was particularly adapted to tumors of moderate size, and in some of those tumors in the liver, lungs, or spleen. Incision is performed when the tumor is within the peritoneum, with the precautions always observed in such operations. Enucleation became necessary in some cases. The paper concluded with an interesting history of the case of a man, 30 years of age, from whom sixteen separate cysts had been removed from different portions of the abdominal cavity.

THE RESPIRATORY FUNCTIONS IN HIGH ELEVATIONS.

From time immemorial physicians have sent their patients affected with chronic pulmonary troubles to the mountains or to the sea-shore, with the object of causing them to respire a purer air, and experience has demonstrated the value of this procedure in the improvement in such cases, especially after a sojourn in the mountains.

Professor Jorlanini has called attention to the fact that it is not only necessary for the patients to live in the mountains to obtain these effects, but that they should adapt their

life to the mode of living of mountaineers. For those who go to the mountains and live a sedentary life rarely experience any improvement in their condition. These ideas were the starting-point of a long series of researches of DR. RIVA-ROCCI, of which the following *résumé* expresses the most important conclusions (*Bulletin Général de Thérapeutique*, October 15, 1890):

Contrary to the opinion generally held, mountain air does not influence the respiration on account of any difference of barometrical pressure. It is, however, true that, in accordance with physiological laws, during repose the respiratory function appears less active on the mountains than on the plains, both from a mechanical point of view and from the point of view of chemical change. This fact is, however, attributable to a sort of compensation which follows the excessive respiratory activity developed during exercise. The happy influences of mountain life depends especially on the enforcement of the respiratory activity which is dependent upon climbing and other physical exercises. In passing to elevated heights there is at first an exaggeration of all the respiratory mechanism and an increase in the frequency and depth of the respiration acts, with, of course, consequent increase of the mechanical function of the lungs. Then, on descending after such a climb, almost the same effects are observed, though in a somewhat less degree. On the other hand, during the periods of inactivity, the destructive and eliminating functions being diminished, mountain life favors the organism in aiding the reintegration and reassimilation of the materials (with increased appetite and digestive power) introduced into the organism. As a consequence, from the influence of this action of mountain life on the respiratory function, the author believes that such a mode of living is indicated in all those who are threatened with pulmonary phthisis, whether congenitally or acquired. In sending phthisical cases to the mountains it is not necessary to insist upon great elevations,—that is, above the line at which the existence of phthisis ceases. On the other hand, the author believes that the locality should be selected in which the nature of the ground will oblige patients in taking exercise to ascend to heights proportionate to their organic power and the strength of their heart. In other words, it is the climbing which the author believes to be especially important, and that mountain air by itself is of little more value for phthisical cases than the air of the lowlands, unless the life on the mountains be adopted to the locality. In other words, the author concludes by this statement, that to obtain the best effects from mountain life it is indispensable that the patient live as a mountaineer, and not to sit down and quietly wait the more or less problematical effects of the pure and revivifying air alone.

SOME NEW CLINICAL EXPERIMENTS WITH DIURETIN.

KORITSCHONER has recently made numerous clinical trials at the medical clinic of Professor Schrötter, of Vienna, with the new diuretic, *diuretin*, which is a mixture of sodium salicylate and theobromine. These experiments pertained to thirty-eight cases of general dropsy. Ten of these were cases of cardiac dropsy from chronic valvular disease; twelve were cases of dropsy from Bright's disease in some stage; in six the general anasarca was due to dilatation of the heart following emphysema or arterio-sclerosis; in four the cause of the dropsy was degeneration of the myocardium; in three it was hepatic cirrhosis; in two it was tuberculosis of the lung and serous membranes, and in one cancer of the liver.

The formula which Koritschoner uses is as follows:

> Salicylate of soda and theobromine, 4 to 8 grammes;
> Warm water, 150 grammes. M.
> Dose.—A tablespoonful every hour or every two hours.

Diuretin should be given in rather large doses; little benefit can be expected from a less quantity than 4 grammes (60 grains) a day; ordinarily, to get the full advantage of the drug, medium doses amounting to 5 or 6, and maximum doses amounting to 8 or 10, grammes in the twenty-four hours should be administered.

Diuretin is generally well supported, even when its use is prolonged for months. It rarely causes nausea, even in chronic Bright's disease when the appetite is gone and but little food is tolerated. It does not cause vertigo; in rare instances patients complain of palpitation and temporary cardiac distress. Sometimes diuretin provokes diarrhœa.

As a result of these trials by the Vienna physician, the salicylate of soda and theobromine was found to be a very powerful diuretic, and in only five cases did it prove to be without action; these were cases of chronic Bright's disease, arterio-sclerosis with fatty

myocardium, tuberculosis of the lungs and serous membranes; all had arrived at the last degree of cachexia, and succumbed a few days after their admission to the hospital. In ten other cases, the action of the salt was much superior to that of digitalis, acetate of potash, and all other diuretics that had been administered, though but moderate benefit followed the administration of the remedy. In the majority of the patients (twenty-three out of thirty-eight) the effect obtained was excellent, the dropsical effusions rapidly disappeared, and general amelioration followed. There is even danger that, under the influence of the abundant diuresis caused by the drug, the ascites and œdema may disappear so speedily as to cause dangerous collapse. On this account, Koritschoner urges that, in cases of abundant effusions, the remedy should be given with considerable caution; he would, in fact, advise always to begin the treatment by a dosage of 4 grammes a day, and, if this quantity makes no sensible increase in the urine, it may be augmented by one gramme a day till a sufficient result is obtained.

The diuretic action of this medicine is said to be more marked in cardiac dropsies than in renal or hepatic, yet it may render precious service in chronic Bright's disease. In fact, in this disease, where all the ordinary diuretics are apt to fail, the quantity of urine excreted often becomes augmented five or six times under the influence of the salicylate of soda and theobromine. In some cases of Bright's disease, the remedy seems to exert its principal action on the intestines, producing an abundant serous diarrhœa, which, in a very short time, causes the œdema to disappear, without too great enfeeblement of the patient.

According to the researches of Schrœder and Gram, the diuretic effect of the salicylate of soda and theobromine is due to the excitant action of the drug on the renal epithelium. As the epithelium is the principal seat of lesion in chronic parenchymatous nephritis, it might be feared that diuretin would be injurious in Bright's disease. The observations of Koritschoner show that this fear is not well founded, and that diuretin excites the renal functions without irritating the kidneys. Thus, in two cases of acute scarlatinous nephritis, when Koritschoner gave diuretin in large doses, the patient recovered with astonishing rapidity and without any complications. Under the influence of the medicament, the blood-corpuscles and hyaline casts were seen from day to day to disappear from the urine. This same favorable action of diuretin on the nephritic processes has also been noted in chronic Bright's disease.

The new drug has not as yet—as far as we have been able to ascertain—been much introduced into this country, and as theobromine is very expensive, and as the cost of a drug is an important item in the economies of many physicians and their patients, it is doubtful whether many serious trials will be made with diuretin for some time to come.—*Boston Medical and Surgical Journal*, October 30, 1890.

THE TREATMENT OF INFLAMMATION OF THE EXTERNAL AUDITORY MEATUS.

In a paper published in the *Lancet* for November 1, 1890, Dr. J. Swift Walker takes exception to the use of the word "otorrhœa" in inflammation of the auditory meatus, since the disease only becomes "otorrhœa" when it has become chronic by perforation of the membrana tympani, and in consequence the different varieties of inflammatory affections in this locality are not sufficiently recognized, and therefore treatment becomes routine, and in many cases is inefficacious. The simplest form is inflammation from dentition and stomach-derangement in children, and these cases are almost invariably neglected, as the common impression is that the discharge will cease without remedial measures. The contrary, however, is the fact, as, according to Dr. Walker, if the affection be allowed to continue unattended, it is certain to destroy the tympanum or cause perforation. When treatment is used for such cases, carbolic acid is the one which is generally employed, and yet Dr. Walker maintains that there is nothing more irritating to the inflamed meatus and tympanum than this preparation, and that really no disinfection is required until there is perforation of the drum. In the simplest variety of inflammation of the meatus in children nothing is so effective as calomel purge, and a little belladonna and chloroform liniment, equal parts smeared over the mastoid region to relieve the pain, which is sometimes very distressing. If the disease goes on further, and there is a mucous purulent discharge, wipe out the discharge daily with a little piece of wool wrapped round an ear-probe; then paint the meatus with tannate of glycerin.

In exanthematous inflammation, after any of the zymotic diseases, as scarlatina, measles,

etc., we come to a very intractable form of the affection, which requires great care and attention with perseverance. The author then recommends as a lotion, alum iron, three drachms; sulphate of zinc, two drachms; water, to eight ounces. The ear is first to be thoroughly syringed with warm water, then dried thoroughly with cotton-wool, so as to wipe out all discharge and the lotion administered. In all such cases it is absolutely necessary that the Eustachian tube should be opened, and this can be accomplished by using a Politzer's bag or the catheter once a week. The syphilitic and tubercular otorrhœa must be treated upon the same principles, but with the addition of strict hygienic and constitutional treatment.

CEREBRAL CONTUSION.

At the recent meeting of the New York Medical Association, DR. CHARLES PHELPS read a paper on this phase of the subject (*Medical Record*, November 1, 1890). The brain contusion might take place at the seat of external injury, or on the opposite side, or somewhere between. Contusion by contre-coup had received little attention in medical literature since the publication of Holmes's "Surgery." That it was important and frequent he had been enabled to demonstrate by several post-mortem specimens, as well as by subjects. In one specimen the blow had caused complete separation at the temporal, sphenoidal, and parietal juncture on one side, yet on that side the brain showed no injury; while at a corresponding point on the opposite side was an extensive contusion.

There might be no external sign of injury where contusions of the brain existed, producing symptoms mistaken for alcoholism. He cited such a case. The mistake was commonly made by the police of regarding patients as under the influence of alcohol when suffering from cerebral contusion. The two conditions were likely also to coexist. In a case at St. Vincent's, in 1880, a man died eighteen days after injury to the occipital region; autopsy showed an abscess in the cerebrum some ways distant and interior. An early diagnosis in such cases was often obscure, if not impossible. There had been cases of severe contusion without concussion. He gave the following conclusions: 1, Cerebral contusion may be either direct or by contre-coup, and may be either limited, diffuse, or attended by hemorrhage upon the surface of the brain; 2, the superficial hemorrhagic form may cause early death by compression; 3, the limited or diffuse form may cause early death through consecutive general hyperæmia; 4, the symptoms then resemble those of alcoholic intoxication, for which it is usually mistaken; 5, the limited or diffuse forms may cause death at a later period by the formation of abscess; 6, contusion of the brain, with the possible exception of cranial fracture, is in general the most frequent cause of death in injuries of the head as a class.

THE TREATMENT OF PURULENT AND INFECTIOUS PLEURISIES BY INTRA-PLEURAL INJECTIONS.

At the meeting of the Société Médicale des Hôpitaux, held October 17, 1890, DR. FERNET presented a communication with the following conclusions (*La France Médicale*, October 24, 1890):

The treatment of purulent infectious pleurisy, according to the antiseptic method, by the procedure of puncture, followed by intra-pleural injections, is warranted by the fact that, as is the case with antiseptic thoracotomy, it fills the double indication of evacuating the transuded liquid, and of directly and locally combating the affection. The especial indications for this procedure are relative, on the one hand, to the seat and extent of the purulent collection, and, on the other, to the nature of the pleurisy.

Limited circumscribed pleurisies are always amenable to this treatment, which, further, is especially applicable to purulent pleurisies, whether of tubercular origin or due to the action of the pneumococci. It, however, seems less applicable, according to the author, to the treatment of pleurisies of streptococcic origin, and especially in the case of putrid or gangrenous pleurisies. The early performance of antiseptic pleurocotomy is, nevertheless, of great value in the treatment of the majority of cases of purulent pleurisy, and should always be relied upon when the employment of puncture and injection have been proved to be inefficacious.

There are two methods of employing intra-pleural antiseptic injections,—either the repeated injection of the liquid into the infected spot without evacuating the transuded liquid, or a preliminary evacuation of the transudation, and then washing out the cavity with an antiseptic. Both of these methods possess certain indications in certain definite cases. The first, according to the author, deserves consideration as a preventive or palliative to

combat the infectious character of pleurisy and to delay or prevent the development of infection or to prevent the affection from becoming purulent.

The second method is, however, a curative one, and it acts by destroying the infection and so producing a cure. Among the remedies which the author employs for washing out and injecting into the pleura, he especially uses either the soluble antiseptics,—such as corrosive sublimate, chloral, chloride of zinc,—or the insoluble antiseptics,—such as naphthol or creolin,—which, he says, are of especial advantage in injections which it is desired to lead into the pleural cavity.

THE TREATMENT OF BILIARY COLIC.

In the treatment of biliary colic the most important indication is to lead to the increase of the biliary secretion, so as to enable the removal of the obstruction and to force it onward into the intestine. The contraction of the bile-ducts and gall-bladder may perhaps act as auxiliaries in accomplishing this result, but the increase in the biliary secretion is the end to be aimed at.

In a paper published by PROFESSOR SÉE, in *La Médecine Moderne*, November 6, 1890, while emphasizing the importance of the early removal of the calculus, the author shows that, in the first place, it is necessary to lessen the suffering of the patient, and that the most reliance should be placed upon a hypodermic injection of morphine, in spite of the fact that morphine itself tends to reduce biliary secretion. Antipyrin exercises little influence on the biliary secretion, but it is of little value in relieving pain. Chloral, if employed at all, should be given in enemata, while chloroform is of undoubted value not only in relieving the pain but also by causing relaxation and dilatation of the bile-ducts, and so perhaps facilitating the removal of the calculus. It must be recognized, however, that the indications for the use of narcotics and anæsthetics is a secondary one, and that they should be only employed with the idea of relieving pain, and so perhaps causing a relaxation of the bile-ducts, while the most attention should be directed towards the increase of the biliary secretion.

Experiment has shown that the presence of any mechanical irritation in the bile-ducts serves to increase this secretion. Of the cholagogues, turpentine is one which has certain powers, but it is difficult to employ it in sufficient dose. Nevertheless, it is to this substance that Durand's remedy owes its efficacy. Salicylate of sodium has been recognized as a cholagogue by a number of eminent experimenters, and in watery solution markedly increases the biliary secretion, especially in the amount of water contained in it. This effect persists for some hours after the use of the remedy, and at the same time, in addition to its cholagogic action, also possesses certain values as an analgesic, and should, therefore, not be overlooked in the treatment of the painful stage of the attack. Dr. Sée speaks of the results, especially obtained by Rosenberg, as to the value of olive oil in the treatment of biliary colic, and maintains that, after the administration of olive oil, the biliary secretion is largely increased, and may so assist in mechanically removing the calculus. In addition to this effect, Dr. Sée calls attention to the fact, likewise claimed by Rosenberg, that olive oil, after its administration in large amounts, leads to the development of considerable quantities of fatty acids, which are themselves capable of dissolving cholesterin. In the condition of biliary lithiasis, cholesterin is precipitated, as a consequence of the insufficient quantity of saponified fats, such as the stearate and oleate of sodium. The olive-oil treatment, therefore, gives to the system the fatty matters which were before in insufficient amount, and it is this excess of fatty bodies, which is eliminated in the stools in the form of white masses, which were formerly mistaken for calculi. From a clinical point of view, however, apart from all theory, it seems to be fairly well established that olive oil exercises a considerable action on the biliary crisis itself, and may lead to the diminution or disappearance of the pain or of jaundice. All purgatives should be avoided that have in themselves any marked energy at all, since by increasing peristaltic action they tend to increase the activity of the bile-ducts and so aggravate the patient's condition; so, also, all substances should be avoided which tend to diminish the biliary secretion, and among them the author mentions salts of potassium, calomel, iron, copper, atropine, and strychnine.

SOME OBJECTIONS TO COCAINE IN GENITO-URINARY SURGERY.

Cocaine is of almost universal application in such operations as circumcision, urethrotomy, meatomy, and usually is used with com-

plete success as an anæsthetic. There are, however, some disadvantages following the use of the drug, and attention has been called to these objections in a paper by DR. BISSELL, published in the *Medical Record* for November 1, 1890.

Since cocaine has been in use it is not uncommon to find, after an internal urethrotomy, one or two pieces of mucous membrane clinging to the urethrotome. They are usually found in the angle between the dilating-bars and the short cross-bars.

In these operations the Otis urethrotome—an instrument which is very nearly perfect—is always used, and used with the utmost care. After the cutting, the bars are only closed sufficiently to admit of its withdrawal. In about one-quarter of all the cases there was found caught in the instrument one or more pieces of membrane. In some cases the portion torn out was of considerable size. In a recent operation it was over half an inch long and nearly a quarter of an inch at its widest point.

Where ether is used in the internal operation with perineal section this accident is not noticed. In order to be still more certain that the cocaine caused the trouble, Dr. Bissell made applications of cocaine to normal urethræ, and into urethræ with large calibre strictures, as if about to perform internal urethrotomy, waited the usual time for it to absorb, and then, through the endoscope, observed the condition of the urethral wall. There was a little more difficulty than was natural in entering the proper-sized tube. The mucous membrane was blue and congested, and pointed into the opening of the tube. In the pathological urethræ these appearances were most marked.

This narrowing of the canal and fulness of the mucous membrane would account for the frequency with which the latter is caught and torn away by the smallest closing of the bars of the instrument. Future stricture or permanent contraction of the penis will be a very natural result of this laceration. Hemorrhage after the operation is another disadvantage of cocaine. Bleeding during the first night is more likely to occur after cocaine anæsthesia than after ether or chloroform, as can be observed in cases of external section. This hemorrhage is not of much importance in hospitals, or where a competent nurse is in charge; but when the care of the patient is left, as it often has to be, to a lay friend, it may be a very serious matter.

In circumcision, cocaine rarely gives trouble during the operation. If the solution is injected too close to the line of the cut, the swelling it causes may obscure the edges and leave a ragged and irregular line of union.

The extravasation of blood, which is almost unavoidable where the cocaine is injected into the subcutaneous tissue, is objectionable. In some cases superficial sloughing of localized points may result from this extravasation and make the healing slow and troublesome.

A very serious objection to cocaine in circumcisions is in children or in very nervous patients. The sight of the instruments, the dressings, the pain of the hypodermic punctures, and feeling and hearing the cutting and sewing up of the wound will cause severe shock in a delicate and sensitive child, and may frighten him into hysterics or even convulsions.

Chloroform is so easily given, and so harmless in children under ten years, that it or ether ought to be used in preference. Idiosyncrasy may account for certain cases in which the drug, however skilfully applied, does not completely anæsthetize.

Other cases occur in which the tissues, owing to pathological changes, do not absorb the solution rapidly enough, or sufficiently, in the quantity it is safe to use, to cause complete freedom from pain.

Cocaine-poisoning is always possible, even with moderate quantities of the drug.

THE RÔLE OF THE PARASITE IN SKIN-DISEASE.

MR. DALE JAMES, in his presidential address to the Sheffield Medico-Chirurgical Society, took as his key-note the influence of bacteria in the production of diseases of the skin, and predicted that "the victories of the immediate future in the domain of dermatology will be gained through the recognition of the immense possibilities of bacillary infection." This is, doubtless, true to a very large extent, and we have only to look back a few years—before, in fact, Pasteur, Lister, and Koch had given us the result of their labors—to find that the only diseases of parasitic origin were, on the vegetable side, those due to the hyphomycetes producing favus, the various forms of tinea tricophytina, tinea imbricata, and tinea versicolor, and perhaps the fungus-foot of India; while, on the animal side, were the acarus scabiei, the chigre, guinea-worm, filaria sanguinis hominis, and the harmless demodex folliculorum, to which

are to be added the different kinds of lice and a few other accidental ectozoa. To the animal group we have added very little until the last year or so, in which Darier's researches render it probable that the coincidial forms of life called psorosperms play an important part in the production of some diseases, such as Paget's disease and the rare affection called Darier's "psorospermose folliculaire vegetante;" while other observers have thought that these organisms are present in rodent ulcer and molluscum contagiosum. What the exact interpretation is of the presence of these low forms of animal life remains to be proved, but it may be that a new and very important chapter of pathology, not only of the skin, but of many internal organs, is about to be opened up. All this, however, is as nothing compared with the etiologically and practically important part played by bacteria and micrococci in disease of the skin. At present we are bewildered by their numerous varieties and ubiquity, but what we already know and what we may fairly conjecture about their influence afford bright promise for the future.

The diseases acknowledged to be bacillary are leprosy and rhinoscleroma with their special bacilli; also the group due to the tubercle bacillus, lupus, struma, tubercular ulcers, and, according to Riehl and Paltauf, verruca necrogenica. When we turn to the diseases due to pus-cocci—chiefly staphylococcus aureus and albus—we have impetigo contagiosa, boils, carbuncles, the impetiginous form of eczema, and, as a result of mixed infection, kerion of head and beard, and acne pustules; while probably ordinary sycosis is also the result of similar or identical cocci. Some cases of purpura have already been proved by Russell and Cheyne to be due to bacterial emboli, and Koch believes in a still further extension of their influence in the production of purpuric extravasations. Among diseases which, on clinical and therapeutic grounds, are also probably due to bacilli or cocci, though actual proof is still wanting, are seborrhœa, capitis and corporis, the grouped comedones of children, and perhaps the more common form in adults, pityriasis rosea, common warts, the multiple gangrenous dermatitis of infants, and such tropical diseases as yaws, verruga Peruana, and Oriental boil, unless these last are to fall under the domain of the new rivals, the psorosperms.

An extremely important development of the theory, if true, is the one which Unna, in opening the debate on "Eczema" at the late British Medical meeting at Birmingham, put forward, on what he considers sound *a priori* grounds,—viz., that the multiform dermatitis which we include under the term of "eczema" is entirely of parasitic origin, though he does not pretend to have found any particular organism to which the inflammation may be due. All the factors which most dermatologists are wont to regard as etiological—such as gout, rheumatism, digestive derangements, and nervous exhaustion—are for him merely conditions which perhaps render the soil more suitable for the development of the germ. This, however, is a large claim, which few dermatologists will accept either as probable or in accordance with all the clinical facts, and might be put forward on almost similar grounds for nearly every form of dermatitis. That micro-organisms exist in large numbers on the normal skin has been proved by Uffreduzzi and others, but they are innocuous to sound skin even in the people who are most sparing in their ablutions. That micro-organisms exist in great variety and number in scales, crusts, and other inflammatory products, and that some of them at least exercise an injurious influence, we know to be the case,—with pus-cocci, for instance,—and it is probable that they are responsible for many secondary consequences of inflammation of the skin, and also possibly for keeping up an inflammation that would otherwise subside. To assume that they come in before dermatitis has opened the door, so to speak, and that they should often excite a very widespread inflammation in a few hours, with a symmetrical distribution in definite vascular area and occasionally even along the course of a nerve, appears to us to be mistaking effect for cause, and calculated to hinder rather than promote the advance of the pathology of the skin. The theory of secondary infection by micro-organisms of inflamed surfaces seems to be more in accord with clinical facts and to be capable of yielding important practical indications for antiseptic treatment, while it does not discourage intelligent efforts by the physician to render the patient's organism less prone to inflammatory changes on slight provocation, whether that inflammation be in internal organs, mucous membranes, or skin. Highly important as the germ theory is, it will be a retrograde step in pathology and therapeutics if, ignoring the rich vascular and nervous connections of the skin, we treat it as if it were independent of all it encloses, and simply sterilize it

instead of trying also to act upon it by intelligent treatment of the rest of the organism, as we do in diseases of other parts of the body.—*Lancet*, October 25, 1890.

Reviews.

MANUAL OF CHEMISTRY. By R. A. Witthaus, A.M., M.D., Professor of Chemistry and Physics in the University of the City of New York; Professor of Chemistry and Toxicology in the University of Vermont, etc. Third edition.

New York: Wm. Wood & Co., 1890.

"Witthaus's Chemistry," which, within seven years, has reached three editions, is essentially a chemical text-book for the use of medical students, and admirably fulfils its purpose. The descriptions of processes of manufacture with which so many text-books are overloaded are brief, while the chemistry of hygiene, therapeutics, and toxicology occupy especially prominent positions.

The work is divided into three parts. In the first the principles of chemical science are treated of, as well as so much of chemical physics as is absolutely requisite to a proper understanding of that which follows. The second part treats of special chemistry, and shows a departure from the usual methods followed in chemical text-books in that the elements are classed not as metals and metalloids, but into classes and groups, according to their chemical character. Such a method evidently possesses great advantages over the mode of classification proposed by Berzelius of metals and metalloids, for several elements formerly classed among the metals resemble the so-called metalloids in their chemical characters much more closely than they do any of the metals; and it is evident that a classification based, as under the system of Berzelius, upon physical properties, which in many cases are ill-defined and variable, is unsatisfactory. The method of classification adopted by Professor Witthaus is based upon the chemical properties of the oxides and upon the valence of the elements, forming a division of four great classes, according to the nature of the oxides and the existence or non-existence of oxysalts. In the first class, which he terms the "typical elements," he places hydrogen and oxygen, for the reason that, although they differ from each other in many of their properties, they both play an important part in the formation of acids, and neither could find a suitable place in either of the other classes.

The second class includes all the so-called metalloids, except hydrogen and oxygen, and the author defines them as those elements whose oxides unite with water to form acids, but never to form bases, and which do not form oxysalts.

The third class contains those elements whose oxides unite with water, some to form bases, others to form acids, and which form oxysalts.

The fourth class comprises those elements whose oxides unite with water to form bases, but never to form acids, and which form oxysalts.

A novelty in the third edition of Dr. Witthaus's text-book, and one which will strike most readers as a decided innovation, is in the orthography of certain words, such as chlorine, chlorides, etc., which has been modified in accordance with the views expressed in the report of the Committee of the Chemical Section of the American Association for the Advancement of Science, presented at the Toronto meeting in 1889. Thus, all chemical compounds which now end in *in* and *ine*, according to the new method of spelling terminate only in *in*. Thus chlorine is chlorin, pronounced chlō'rĭn; iodine, ī'ōdĭn; morphine, mōr'phĭn; the reason given being that this pronunciation distinguishes clearly between *id* and *ite*, so aiming at avoiding the confusion which often arises between chloride and chlorite, sulphite and sulphide, etc. Further, the final *e* is dropped in all cases, thus departing from the system suggested originally by Watts of indicating alkaloids and other basic substances by the terminal *ine* and all others or neutral substances by *in*. While the system thus outlined undoubtedly has many advantages, its adoption seems as yet rather untimely in view of the fact that the U. S. Pharmacopœia designates alkaloids and other bases by the final *e*, glucosides and other substances by its absence.

BACTERIOLOGICAL TECHNOLOGY. By C. J. Salomonsen. Authorized translation from the second revised Danish edition by William Trelease.

New York: William Wood & Co., 1890.

While many works on bacteriology are accessible to the reader familiar with German, yet a short and clear succinct statement of bacteriological investigation in English is highly desirable, and the scope of the volume before us is such as to satisfactorily fill this vacancy. Dr. Salomonsen's work is well adapted to those who, without the assistance of an instructor, desire to carry out studies

in bacteriology, and, although it does not attempt to give a presentation of the entire technology of the subject, it describes the simplest and most easily managed methods, so that, with a very moderate outlay, a laboratory may be fitted up which will answer all general purposes for those who do not wish to go too deeply into the subject. The work is illustrated with seventy-two figures, principally of the various forms of apparatus required. Its usefulness would be greatly extended by plates, showing the characteristics of the different bacteria and micro-organisms.

ARBEITEN DES PHARMAKOLOGISCHEN INSTITUTES ZU DORPAT. Herausgeben von Dr. R. Kobert, Kaiserlich Russischem Staatsrath. Bd. v. Stuttgart. Verlag von Ferdinand Enke, 1890.

STUDIES FROM THE PHARMACOLOGICAL INSTITUTE OF DORPAT. Published by Professor R. Kobert.

Vol. V. of Professor Kobert's contributions to pharmacological literature sustains the reputation earned by the scientific character of his earlier publications. The volume before us contains three elaborate studies,—the first, on the "Action of Uranium," by Jacob Woroschilsky; the second, on the "Action of Tungsten," by Jacob Bernstein-Kohan; and the third, on the "Action of Urechites Suberecta," by Michael Minkiewicz. The latter was contributed to the original columns of the GAZETTE, and was published in the THERAPEUTIC GAZETTE for August, 1888.

The article on uranium is confirmatory of the results obtained by Professor R. H. Chittenden, and published in the GAZETTE for October 15, 1888, p. 698. The author has shown that uranium is one of the most poisonous of metals, even in doses no larger than $\frac{1}{300}$ of a grain for every two pounds of body-weight; and that the oxide is a most intense poison, and in this dose readily produces death. When given in the form of the nitrate or the acetate, by the mouth, it produces gastro-enteritis; and in doses of $\frac{1}{64}$ of a grain for every two pounds of body-weight produces violent hemorrhagic nephritis, various forms of paralysis likewise preceding the fatal issue. Uranium appears to differ from all other metals in that, in addition to the hemorrhages in the intestinal mucous membrane and in the kidneys, numerous ecchymoses are likewise produced in the peritoneum, endocardium, heart-muscle, and even in the liver, so that the conclusion appears warrantable that uranium produces direct modifications in the walls of the blood-vessels. Experiments made with the arterial circulation through various organs showed that uranium produces marked vascular dilatation, while, further, the reduction of oxyhæmoglobin is largely prevented. In fact, the author attributes the great vascular dilatation which follows the administration of uranium as analogous to the production of the same state of affairs by highly venous blood; so also the irreducible oxyhæmoglobin may be looked to as the cause of the intense disturbance of nutrition which follows the administration of uranium. For, since the oxygen is incapable of leaving hæmoglobin in its normal manner, disturbance of nutrition must result, and in this manner emaciation in cases of chronic poisoning is to be explained, as already pointed out by Chittenden. The author likewise confirms the presence of glycosuria as a constant symptom in uranium-poisoning, for as long as uranium is circulating in the blood internal respiration is interfered with. Thus oxidation of sugar is prevented, and the latter, therefore, appears unchanged in the urine. When, however, uranium is removed from the blood, then the oxidation in the tissues normally occurs and the glycosuria disappears. The author, as the result of the facts which have accumulated as to the properties of uranium, recommends the inclusion of uranium in the list of the most violent poisons.

Dr. Bernstein-Kohan's paper, on the "Action of Tungsten," includes the complete historical study of the chemistry and toxicology of this metal, with a number of original experiments made upon cold-blooded and warm-blooded animals, with elaborate estimations as to the mode of excretion of tungsten and its deposit in the different tissues and organs of the body. He finds that, even after subcutaneous injection, at least forty per cent. of the tungsten given is eliminated from the intestine and appears in the fæces; while in animals in whom vomiting is possible considerable quantities of tungsten are to be found in the ejecta. While the greater part of the tungsten injected, which escapes elimination, is to be found circulating in the blood, considerable percentages are also deposited in the liver, kidneys, bones, and muscles, while at least ten per cent. is found in the intestines. An astonishing fact detected by the author was that, while the intestinal mucous membrane is the most active in the elimination of tungsten, its absorption from the intestinal canal may almost be said to be imperceptible. Consequently, tungsten may be placed among the slightly poisonous

metals, provided the mucous membrane of the alimentary tract be uninjured, since absorption through this system is practically impossible; and although in its chemical characteristics tungsten is closely associated with uranium, the poisonous dose of the former is nearly one hundred times larger than the latter. Chromium also is closely allied with uranium and tungsten, but of this group uranium is the only one which has been found to produce diabetes. The symptoms of poisoning by tungsten agree in general respects with those of the other heavy metals,—loss of appetite, nausea, vomiting,—which may become so violent as to produce severe gastric hemorrhage, diarrhœa, and, in advanced cases, convulsions, paralysis, and finally death. The most marked symptoms detectable post mortem are found in the alimentary canal and kidneys in the form of extensive vascular ruptures.

SAUNDERS'S QUESTION COMPENDS, NO. 12. ESSENTIALS OF MINOR SURGERY AND BANDAGING, WITH AN APPENDIX ON VENEREAL DISEASES. By Edward Martin, A.M., M.D.
Philadelphia, 1890.

We suppose that there must be a demand for such books as the above, or writers would not write them and publishers would not publish them. The objection to this class of books is that they are abused; the student neglects his text-books, and is satisfied with the very scant knowledge he obtains from a compendium, by which he has lost the opportunity of laying a good and solid foundation upon which to build his future medical education. Although there is an objection to this kind of medical literature, yet it fills a certain purpose, and, if not wrongly applied, there is something good to be said for it. Diplomas are to be obtained, and, in order to obtain them, students must pass examinations. Therefore, to assist at the time of these examinations, such books as Dr. Martin has written, and written well, fill a want that all overworked students can well appreciate.

To now consider the little book that Dr. Martin has written for the purpose of assisting the student "to formulate his knowledge upon subjects usually treated as of minor importance in his surgical course," it may be said he has given a very practical and systematic study of the subject, showing very evidently his familiarity with the needs of students, and we have no doubt they will be much aided during their college course by a frequent reference to its pages. While we may speak well of that which relates to the surgical part of the book, on the other hand we cannot endorse all which the writer says in his appendix, and its omission would not have lessened the value of the work. An undoubted typographical error has been overlooked on page 131, where it is advised to give "hypodermically a quarter of a grain of morphia together with a sixth of a grain of atropia." One-sixtieth of a grain of atropin is evidently intended.

J. H. C. S.

TERMINOLOGIA MEDICA POLYGLOTTA. A CONCISE INTERNATIONAL DICTIONARY OF MEDICAL TERMS. Compiled by Theodore Maxwell, M.D., Camb., B.Sc., Lond., F.R.C.S., Edin. With the assistance of several collaborators.
London: J. & A. Churchill.
Philadelphia: P. Blakiston, Son & Co., 1890.

The object of this work is to assist medical men of various nationalities to read the literature of other countries. French has been selected as the key language, and consequently French terms are usually translated into Latin, English, German, Italian, Spanish, and Russian, so that a reader of any of these nationalities can find a translation of the French term in his own language by a single reference. For the Latin, English, German, Italian, and Spanish terms, or French and English, a further reference to the French translation will first be necessary in order that a reader who is of some nationality other than French may obtain the meaning of the term he requires. All the words are placed in a single alphabetical arrangement, and in this way repetition is largely avoided; so also adjectives and verbal modifications of sentences, as well as many compound terms, are likewise omitted, since the meaning of these words may readily be found by reference to each of their component terms, and the work, containing only some twenty-five thousand words, is thus practically as useful to the reader as though it had contained three or four times the number differently arranged.

Correspondence.

BERLIN.

(From an occasional Correspondent.)

According to all appearances we stand on the eve of a grand medical event. A few weeks yet and the greatest foe, the most merciless destroyer of the human race,—tuberculosis,—will be under the control of science,

through the unrivalled genius and tireless work of Professor Robert Koch. For the benefit of the subscribers of the THERAPEUTIC GAZETTE, I have taken pains to ascertain all steps thus far undertaken by Professor Koch, and can consequently give you a correct view of the present status of the matter. Shortly after the close of the Medical Congress, Professor Koch had a long interview with the Secretary of Education, Von Gossler, who, in his turn, conferred with the emperor. As the result of these interviews, Koch was temporarily relieved from all duties attaching to the professorship of hygiene and bacteriology, Dr. Ervin von Esmarch, Koch's assistant, being appointed in his place. The plan, as laid out by Koch and the government, was that the former should devote his time exclusively to the experiments relating to the cure of consumption. Absolute secrecy, besides, was to be observed. Koch communicated his secret to the secretary, to the emperor, and to a single medical man,—viz., Dr. Pfühl, military surgeon of the Charité, his own son-in-law. The experiments were conducted in the ward of Professor Senator by Professor Koch, Dr. Pfühl, and his assistant, Dr. Libbertz. The experiments proved so highly successful that the plan of erecting a large hospital for consumptives in Berlin, about to be executed, was dropped at the inducement of Professor Leyden. Leyden himself emphasized in a lecture the brilliant results achieved by Koch and Pfühl. Everything went on smoothly until it was found that, in spite of the great precautions observed, outsiders obtained information of Koch's method. A nurse was discharged, and the experiments were abruptly stopped. It is rumored here in town that an American professor offered the nurse a fortune for the communication of Koch's *modus operandi*. Koch experiments at present *incognito* in a lying-in dispensary on the outskirts of Berlin, where none, not even the attending nurse, knows him. Meanwhile, the government has placed a large sum of money at Koch's disposal, and has decided to erect a special "Koch Institute," on the plan of the "Institute Pasteur," where consumptives will be cured on the new plan, and, besides, courses of instruction will be given to foreign physicians. Already twelve American physicians and students, residing in Germany, have filed their applications for admission, fearing that the crowd of attendants will be enormous. Still, it will be many months yet before the new institute will begin work.

Last week Professor Gerhardt visited Professor Koch, and asked him to treat a patient of his, a lady of very high rank and title, on the new plan. Koch refused point blank, and it took all of Gerhardt's influence and incessant prayers to finally induce Koch to consent. The lady in question was a typical consumptive, though her affection had not yet progressed very far. Koch made the lady swear not to divulge the secret to any one.

I am fortunate enough to be in a position to let you know some of Koch's new treatment. No medicine nor chemicals of any kind enter into the treatment, except a single metal. The chief factor is an "*antitubercular lymph*," prepared by an exceedingly complicated process from animals rendered tubercular for the purpose in question. The antitubercular lymph is injected deeply into the cellular tissues and muscles of the back and the neck. The medicine mentioned above, very likely corrosive sublimate, is not used by itself, but is combined in a certain manner with the antitubercular lymph. As a result of the injections the tubercular process is not only stopped and the existing tubercular foci healed, but the system is also rendered at the same time immure against any other tubercular processes.

What shall we say to it? Remain incredulous? Is it not Koch, the most famous of medical men living, the Napoleon of the healing art? Yes; but Napoleon, too, failed ignominiously when he, intoxicated by the glory and honor won, undertook to enslave all Europe. Again, it is not likely that a man like Koch will stake his reputation on a humbug like Dr. Ferran, the self-lauded conqueror of the cholera.

Yesterday a deputation of Belgian physicians arrived at Berlin to learn and introduce at home Koch's treatment. It is a little too early yet for that. Still, at present, there are no happier people in Germany than the consumptives. They are being congratulated from all sides, and it almost seems as though many growl for not being tubercular subjects. Professor Koch receives daily bagfuls of letters from Germany and other parts of Europe asking him to send in his treatment. Some letters contain fees ranging from a quarter to five dollars. The day before yesterday Professor Nothnagel, of Vienna, delivered a lecture on the subject, in which he declared that there was no doubt that consumption will be shortly a curable disease, and that Professor Koch will rank as the greatest benefactor of mankind. The lecture was listened to with solemn attention.

It is interesting to note that the fight against tuberculosis is taken up with great vigor in

other quarters too. Professor Schroetter, of Vienna, just sent out a notice stating that he has obtained miraculous results in the treatment of consumption with hydrocyanic acid, and that in the next meeting of the Wiener Aerztliche Verein he will read a paper on the subject. It seems, again, that the laurels of Miltiades disturbed the sleep of Themistocles.

Next to the cure of consumption, the subject of "suggestion" occupies the chief interest of the German profession. Some really extraordinary cures through suggestion have of late been reported, which, if it were not for the highly reputable physicians connected with it, might be regarded as fakes. The latest achievement in the line of hypnotism is that of Dr. Ryvalkin, who, in the presence of a number of physicians of standing, has proven that he can produce intense vesication of the skin by suggestion. The subject, a robust young man of 16, painter by trade, was hypnotized, and told that he felt very cold, and that he should place his right arm to a stove to get warm. He was also told that it was necessary to produce a blister on that arm. The suggestion was repeated three times, whereupon the subject was awakened. The young man executed all suggestions faithfully, placed his right arm to the *cold* stove, and instantly uttered a cry of pain and anguish, as if the arm had been in reality injured. Investigation of the arm revealed severe vesication, a large zone of rubefaction. The young man had, besides, such intense pain that he was unable to sleep. Next morning a papular erythema set in, which was exceedingly painful, and in a few hours two blisters of the size of a hazelnut appeared, which opened later spontaneously. It must be added that the subject in question was affected with typical hysteria. This process exceeds clearly the line of things which, to an ordinary mind, appear comprehensive and possible. Even an attempt at explanation would here be absolutely useless. It is little, if at all, short of a miracle.

There is, no doubt, that the influenza has returned; hundreds, as yet, only have been attacked, and your correspondent among the first. In my case I can state as a peculiarity that the disease commenced, just as it did last year, with a *pâté de foie gras* I indulged in, and the upset stomach following. It is, consequently, likely that the United States, too, will be revisited. *Ergo cave anserem!*

In spite of the failure of somnal, and the severe criticism Professor Liebreich subjected its inventor, Dr. Radlauer, proprietor of the Kronen Apotheke at Berlin, to, that chemist cannot refrain from inventing other panaceas. His latest is "antinervine." You would think from this name that Dr. Radlauer's remedy is destined to do the opposite work from a nervine,—*i.e.*, to attack and injure the nervous system. On the contrary, Radlauer's antinervine is claimed to strengthen and build up the nerves. The drug is a white powder, of an acidulous but agreeable taste, easily soluble in warm water, alcohol, and ether. It is really a mere combination of bromide of acetanilide and salicylanilide. Radlauer claims that the new remedy unites all the advantages of bromine, salicylic acid, and antifebrin, without, of course, having any unpleasant features. The dose for adults is from 7 to 15 grains; for children, 4 grains. Antinervine is said to reduce the temperature 2° C., the apyresis lasting from five to seven hours. The indications for the remedy are typhoid fever, tuberculosis, diphtheria, and pneumonia. One advantage the drug clearly possesses, and that is its cheapness, being one hundred and fifty per cent. cheaper than antipyrin. Radlauer sells fifteen compressed tablets of antinervine (seven and a half grains each) for twenty cents.

Another remedy recently put in the market is cephalalgine, a specific against headache. The name is equally perverse, as it clearly signifies a producer of headache; it ought, at least, to be named anticephalalgine.

Visiting the Charité yesterday, hunting for rare cases for the benefit of the THERAPEUTIC GAZETTE, I was shown a man who had just been admitted, with the diagnosis, "Swallowed dollar." The man had made a bet in a saloon that he could make a 3-mark piece, which any one might hand him, disappear in a second, so that no one could find it. A soldier handed him the coin, which the modern Bellachini promptly swallowed. But the soldier took a different view of the affair. Believing that the man meant merely to get away with the dollar, he had him arrested. The police lieutenant at the station-house, however, concluded it was a case for the Charité rather than for the lock-up. The potato-cure was being tried on the man; with what success I cannot say.

Another rare case is a man on whom the operation of cataract had just been skilfully performed. But there is nothing strange in that, you will say. Truly. But the man had no cataract, I will tell you. Even that is not so strange. Did not Nussbaum amputate the wrong leg, as he admitted in his "Surgical Failures"? The strange thing in the case in question is, that the operator was not Schweigger, Hirschberg, or Graefe, but a goat. The

animal, being teased by the man, revenged himself, removing the man's lens in the most approved of fashions. What a pity the man had no cataract!

As I am describing rarities, I might just as well mention one examined recently by Professor Virchow. It is a man with a beard of an unheard-of size. The beard of the man—Joseph Buellesbach, of Nonnenburg-on-the-Rhine—measures one hundred and forty-seven centimetres from the chin to its end. It is notable, as Professor Virchow explained, that all hairs are split up at the end. This disproves the view, thus far generally held, that the splitting up of hair favors its falling out.

The list of medical students attending German universities during the last session has just been issued. It might interest you to learn some of its data. Berlin one might suppose to have the largest number of medical students. It is a great surprise to find that the German metropolis occupies but the third rank in this respect, being outranked by Leipsic and Munich. The figures are as follows: Medical students,—Leipsic, 1594; Munich, 1382; Berlin, 1184. Next to Berlin, follows Wuerzburg, with 997, and Dorpat, with 944 medical students. The instruction in the University of Dorpat will henceforth be given in the Russian language, consequently Dorpat ceases to be a German college.

The Berlin physicians, at least the Chauvinists among them, having, as a result of the Medical Congress, stopped fighting the "Philadelphia doctor," have put on the war-paint against the "German doctor," for a change. A Berlin medical society has petitioned the government to put a stop to the present disgraceful state of affairs, whereby medical candidates, often long before having passed their final examinations, can acquire the title of doctor of medicine. The petitioners ask that this title be conferred only after the passage of the examination of state. I think it would be better to adopt the American plan, whereby the graduation as M.D. and the granting of the license to practise are made simultaneous. The present examination and promotion as doctor in German is a farce, and one of the most ludicrous kind. The candidate is compelled to write a thesis in Latin (quite recently German, too, has been allowed), and to defend the same in Latin *coram publico*, and before at least two opponents. I will not speak of the horrible Latin often used by the disciples of Æsculapius, nor of their frequently exposed inability to express themselves at all in that idiom. I will merely show you how the defending and opposing is done. The candidate goes to two friends of his and hands them a list of opposing remarks to be made by them, and also the answers he will give them. This is done invariably, and the *rector magnificus*, attired with his purple cloak and the insignia of his exalted office, invariably testifies that, as a result of the extraordinary skill and profound knowledge displayed by the candidate in refuting his antagonists and asserting the truth of his thesis, the title of doctor of medicine should be conferred upon him.

BERLIN, November 8, 1890.

BERLIN.

(From our Special Correspondent.)

Just at present R. Koch, in connection with his discovery in reference to tuberculosis, occupies the most prominent position not only in medical circles, but also in the whole thinking and non-thinking world. This is the more easily appreciated, as just now this disease finds its victims in every strata of society, and in such large numbers,—for it is well known that one-seventh of the human race die with consumption,—that for long years it has been wondered how this enemy to mankind is to be combated. Secrecy is still maintained in regard to the experiments; and this fact renders even more numerous the various reports on the subject that are circulated by those for and against. By the time of my next letter, in all these matters the veil will be removed, the result be made public, and there will then, indeed, be another International Medical Congress in Berlin, which, with one accord, will be busy learning the new doctrine. The discovery promises to be of great importance not only to medical, but also to social circles, for it may be truly said that no small part of the social problem at the present time is answered by our views in regard to the curability of phthisis. As we advance in knowledge of the causes of the different infectious diseases, other ones will, perhaps, be victoriously overcome; and, at all events, efforts in this direction should be maintained. Many articles, in our daily papers, of persons who pretend to be well versed in these matters show, at first glance, an inefficient knowledge of the labors of their distinguished coworkers interested in this subject. Especially does the external world, as numerous writings of patients and doctors at our colleges here prove, seem to be prosecuting the work of Koch with feverish haste. But it must here simply be said that all of them will have to

wait until Koch has spoken. The question of the erection of large consumption hospitals for destitute patients—as was agitated by Leyden some time since in reference to hospitals for general diseases—is now being discussed on a broader basis. It is to be hoped that this plan will, after its revival, be adopted by its promulgators, since such patients can be best treated in specialty hospitals, as has been already proved in other countries. Berlin has, up to this time, but few hospitals devoted to special branches of medicine, except the large clinical institutions for patients affected with general or surgical diseases, as well as other establishments devoted exclusively to the treatment of gynæcology, obstetrics, ophthalmology, and otology. There is at the present time no large free hospital for nervous diseases, but small private ones are numerous. Moreover, there are no special hospitals for throat- or bladder-diseases. Judging by appearances, this department of Berlin's sanitary arrangements, which are, in other respects, well regulated, will shortly be subjected to a complete transformation. A new method is suggested in reference to the subject of the adoption of preventive means, or the employment of medical help in sudden accidents. This method is not yet ready to be announced. Still, we may state, that efforts are being made to keep up, both day and night, a connection between the different central stations and all places where human life is in danger from accident, so that the latter can be reached as quickly as possible by medical and surgical assistance, as well as by means of transportation. At present, during the day, when the crowd is greatest in the streets, as well as when the work is most busy in the shops and manufactories, the maintenance of such establishments and institutions is most important; as, for example, between ten o'clock in the morning and two in the afternoon, scarcely any doctors are to be found at their homes, being at that time engaged making calls.

Dr. Edmund Falk has recently presented to the Berlin Medical Society a very fine article on intrauterine medical treatment. The diseases of the endometrium are very important, on account of the greatness of their number, and yet the local treatment of the uterus is neglected by most doctors. In complaints in regard to the sexual system in women—*e.g.*, in menorrhagia—vaginal washes or applications are commonly prescribed. General intrauterine treatment is confined to the specialist. Still, it is necessary that every physician should know how to treat such tedious and important diseases as those of the endometrium, since this matter is of vital importance to the happiness of married life, to that of the family circle, and, indirectly, to that of the state. For this an easily applicable method of treatment is desirable. Liquid injections into the cavity of the uterus have—so we read—been followed at times by peritonitis and even by death. Moreover, they are not rendered free from danger by a previous dilatation of the cervix, and are also difficult in their methods of being applied. If a dilatation of the cervical canal be desirable, it is best accomplished by the use of tampons of iodoform gauze. The local use of other medicines in the liquid form is to be resorted to, their introduction into the uterus being accomplished by a goose-feather, or, if not sufficiently adhesive for this, by means of raw cotton, with suitable applicators. But with women who have not borne children a previous artificial dilatation of the cervical canal is necessary, and the treatment, chiefly used in endometritis cervicis, is most applicable here, because, higher up, the remedies applied are so influenced by the secretions that they can exert no real effect upon the mucous membrane. Another method of making application within the uterus is that by means of tents and salves; and for these reasons we must have a clear idea of the capacity for absorption possessed by the mucous membrane of the genital track. As a rule, we know nothing of the power of absorption in the virgin uterus. Falk introduced into the uterus tents medicated with corrosive sublimate, tannin, and lithium chloride, protected the vagina against the outflowing substance, and, after a given time, having syringed out the vagina, emptied the bladder with a catheter. Thus, in order to be sure of absorption by the vagina, the uterus was examined when completely isolated. Fifty minutes after the introduction within it of tents medicated with the iodide of potassium, the presence of the iodine could be proved in the urine. The power of absorption possessed by the mucous membrane of the vagina was much more slow; and, indeed, the tincture of iodine and glycerin, as is generally used on vaginal tampons, was absorbed still more slowly than a salve containing an equal percentage of the iodide of potassium. The mucous membrane of the normal labia seems so perfect as not to possess any capacity for absorption. Now, since the mucous membrane of the uterine cavity is readily absorbent, many remedies introduced into it will be able to exert a general effect; and it is, therefore, highly important that these various drugs affect the system at large only in such a manner as will be without injury to the patient.

The subject of the treatment of the uterine cavity with tents is one of wide range, as those made with cacao-butter, which is soluble, may be readily absorbed, while the ones made with gelatin form a few days after their introduction a tenacious mass, which does not dissolve in water at 60° (within half an hour), and can, for this reason, act in the uterus only as a foreign irritant. Landau adopted the use of grooved sounds, as were used by Caspar in the treatment of chronic gonorrhœa in the male urethra, and by means of these grooves the medication was introduced with cacao-butter, as the menstruum. Falk tried the antrophors or applicators introduced by Stephan, of Dresden. These were thin, spiral pieces of metal, which were covered with the medication in an easily soluble coating of glycerin. These curls of metal, in order to be less easily liable to be bent, were made of highly-tempered wire as a basis, by which means they might adapt themselves to every desirable shape, and thus fit into every wrinkle of the uterine mucous membrane. The metallic wire is not heated very hot, so that it retains its elasticity, and cannot inflict any injuries. The spiral wire itself, in order that it may not cause any abrasions after the melting of the medication, is protected by an insoluble gelatin covering, over which the more easily soluble gelatin menstruum, containing the medicament, is applied. The gelatin is sterilized by being previously heated to 100°. In from three to ten minutes it dissolves in the cavity of the uterus, and the remedy is thus brought in immediate contact with the mucous membrane of that body. After previously disinfecting the parts with a solution of carbolic acid (by means of a forceps or tent-holder), the application of this remedy is very easily accomplished by passing it through the orifice, and that, too, without either dilating the cervix or cutting the anterior lip. After this the woman lies down ten minutes. Then the spiral wire is removed by means of a thread, fastened in the handle of the applicator, and the patient can immediately go about her business. In this manner many drugs that were previously confined within a narrow sphere are now finding a broader field of usefulness.

Verf has thus made experiments with numerous kinds of drugs, and found that, in diseases of the endometrium, the viscid secretion becomes thinner, its color changes; finally, it gets colorless, and decreases in quantity; erosions caused by its passage heal up, and the mucous membrane becomes normal again. In fungus endometritis the use of these antrophors are of special value. They are covered with a one per cent. dilution of the chloride of zinc, or later with a three-tenths to a one per cent. cuprum sulphuricum, with a ten per cent. of resorcin, and with a five to ten per cent. dilution of tannin. Gonorrhœal endometritis was treated by means of antrophors, using a two per cent. dilution of creosote, and with it one-tenth per cent. of the bichloride of mercury, then with a mixture containing one per cent. of the chloride of zinc and one-tenth per cent. corrosive sublimate. The chloride of zinc penetrates directly into the mucous membrane, and makes it possible for the bichloride of mercury to get into those depths where the gonococcus dwells. Among the list of consequences, Falk mentions hemorrhage, especially after certain remedies, and also uterine colic, which latter is to be completely avoided by the addition to the remedy of cocaine. Finally, in perfectly isolated cases, after the use of applications of too great strength, there was caused inflammation of the surrounding viscera, so that, even by this method of treatment, not all the dangers of intrauterine disease have been overcome.

BERLIN, November 13, 1890.

POSTSCRIPT.—The hope of learning more about Koch's discoveries, which are so full of promise to the human race, is being gratified sooner than was expected. The publication of the work appeared the day after my mailing the above article, in an extra edition of the *Deutsche Medicinische Wochenschrift*. Nearly all the journals have copied the paper verbatim; the windows of most of the book-stores are crowded with dozens of copies of the above-named magazine. When this letter is published most readers of the GAZETTE will already have received interesting information on this important subject. Nevertheless, I shall very briefly give a *résumé* of its contents.

The remedy itself and its mode of being prepared will be published later, as the researches on the subject have not yet been completed. It is a brownish liquid, which should be as freshly prepared as possible, and is to be administered by hypodermic injections. A man is much more susceptible to its influence than a guinea-pig. The latter bears well a hypodermic injection of 1 to 2 cubic centimetres of the undiluted remedy, while .25 cubic centimetre will exert a very great effect upon a man. Three hours after the injection of the remedy there was a feeling of languor and dyspnœa, together with rigors, vomiting, and a rise in temperature to 39° C. In twelve hours there was an intermission of these symptoms, the weakness continuing for several days longer. The small-

est dose to affect a man is .01 cubic centimetre. *The remedy exerts a specific effect on tuberculous disease of every variety.* In tuberculous patients an injection of .01 cubic centimetre will produce a severe reaction. It is followed by a fever, attended with rigors, together with pains in the limbs, faintness, vomiting, and some coughing. In several cases there were noticed a slight icteroid discoloration, and on others an eruption like that of measles was observed on the chest and neck. When we have abundant proof of a fact our opinions are most easily influenced in its favor. The effect of this remedy is most easily studied in lupus, because in that disease it is most visible to the eye. A few hours after the so-called peripheral injections there appear a swelling and reddening of the lupus, which is very marked. In the limited diseased spots a white centre, surrounded by a red band, is seen. After the decline of the fever, the swelling subsides. The lupus spots are then covered with crusts, formed by the escaping serum, which fall off in from two to three weeks, leaving a clean cicatrix behind. Generally several injections are necessary with which to obtain this result. The changes are limited to the diseased tissue, and always go straight to the part affected, so that, if a tuberculous process be present anywhere in the body, the injection is a valuable means of discovering it, a fact which is of great value in doubtful cases of tuberculosis. The diseased tissue is generally thrown off as a dead mass, while in other cases it seems gradually to disappear. *Moreover, his remedy does not destroy the bacillus tuberculosis, but the living tuberculous tissue.* Dead caseous masses are not influenced, nor are the tissue which is made necrotic by the remedy destroyed. The remedy may be administered rapidly in increasing doses,—in three weeks five hundred times of the original dose. In tuberculous diseases of the skin, glands, bones, and joints larger doses were given, with longer intermissions. Consumptive patients—which class are very easily affected—received .01 cubic centimetre, until no reaction followed its administration; then .02 cubic centimetre, until the same result was obtained, and so on till either the original or more than the original dose was given, especially when the patients were not strong. Later they received larger and more frequent doses. Expectoration and coughing increased at first, and then entirely disappeared. The purulent sputa became viscid; then the bacilli gradually decreased, and the patients went on improving, the bacilli being found at times in the expectoration till it ceased. Night-sweats decreased, and the weight increased. Patients treated in the incipient stage of the disease were, judging from all appearances, well in from two to six weeks. Patients with cavities not too far advanced were markedly improved. In those with larger expectoration there was less expectoration, but no improvement otherwise. *Koch maintains that incipient phthisis is to be cured with certainty by this remedy.* (Later attacks will be treated as easily as was the first illness.) Perhaps the difficult cases may be helped by their being treated by surgical means, and the treatment is best pursued in hospitals. The former method of treatment by means of free air, attention to diet, etc., may still be pursued with advantage in connection with that by injections. An early trial of the new remedy is recommended, and for this an early diagnosis of phthisis is indispensable.

BERLIN, November 15, 1890.

PARIS.

(From our Special Correspondent.)

Generous Emulation—Professional Secrecy—A Medico-Pharmaceutical Conflict—Self-Perforation of Stomach after Death—Unreliability of Children's Testimony—Abortionists Hunted Down—A New Way to Dispose of Fœtuses.

Koch's new discovery is naturally the medical topic of the day. It is not within the province of a Paris correspondent to say much on the subject, especially since the process is kept a profound secret, temporarily it may be hoped. Incidentally, however, it is not amiss to state that the German scientist has been forestalled here by co laborers working in the same field, though probably delving in another furrow. On August 18, 1890, Drs. J. Grancher and H. Martin, of the Pasteur Institute, read before the Academy of Sciences a preliminary memoir on tuberculosis vaccination, which they had, nine months before, left under seal in the hands of the secretary of the Academy of Medicine. They said the work was still incomplete; but, at the Berlin Congress, Dr. Koch having related his experiments on guinea-pigs' tuberculosis, they found themselves compelled to publish their own investigations rather sooner than they would have liked to. The experiments were made on rabbits with inoculations of tuberculosis cultures of graduated virulence. To mention only their conclusions, they averred they succeeded in imparting to rabbits great resisting power against the most virulent and deadly sort of

experimental tuberculosis, and in giving to them against the same disease an immunity lasting for an unknown period. Dr. Koch's process for guinea-pigs, they added, was apparently based on a different principle. "Hence, it may be hoped we shall have, some day, several means for effectually combating the tuberculosis bacillus." Briefly stated, Drs. Grancher and Martin's method is substantially the same as Pasteur's vaccination process for rabies. The memoir in question did not attract much notice at the time; neither did Koch's, for that matter. The case is now different. But while Koch has found many scoffers and opponents, Pasteur said at once he had not the slightest doubt on the genuineness of Koch's discovery, and on November 18 sent to him the following telegram: "M. Pasteur, and the staff of the Pasteur Institute, address to Rob. Koch all their congratulations for his great discovery." This generosity to a rival will astonish no one who knows Pasteur, but it is doubly meritorious when coming from a Frenchman to a German.

Professional secrecy, everywhere a physician's moral duty, is here a legal obligation, enforced, as you are probably aware, by penal statutes. The rule is, no doubt, on the whole, a good one. Yet, like all rules, it is liable to exceptions; for instance, when it conflicts with other obligations equally binding, and sometimes even more imperative. Thus French physicians occasionally find themselves in an unpleasant alternative, from which they would like to be relieved. As a case in point, the following occurrence was recently related before the Society of Public Medicine and Hygiene. Last spring the Z. family took furnished rooms in a town near Paris, and called in Dr. X., who found one of the children affected with the itch and another with pediculi. Next, another child took the scarlet fever, and recovered. Then the mother had a baby, and was confined in the very bed and sheets of the scarlatinous child. After accouchement there were some septic complications, but she also recovered. Finally, the family moved out. Under the circumstances, Dr. X. thought it his duty to tell the landlord that the rooms, in his opinion, should be disinfected. This was done, but the landlord sent in the bill to Z., asking for payment. Z., although a foreigner, seems well posted on French law, stoutly refused to pay, and now proposes to enter a complaint against Dr. X. for having violated the professional secret. In consequence, Dr. X. asked the Society's advice, and, if possible, its moral support in the impending prosecution. Unfortunately, the Society could promise neither. Opinions differ on the subject, and although Dr. Brouardel and others think in such cases the physician should speak, the majority believe, under the present law, he is bound to remain silent. The only remedy is to have the law amended as regards contagious diseases. Dr. X.'s case not being an isolated one,—others have been related in this correspondence,—the subject naturally came up before the Consultative Hygiene Committee of France, an official body, composed of eminent physicians, pharmacists, and sanitarians, often consulted and usually listened to by government. A national health bill being now in preparation by the Minister of the Interior, the Hygiene Committee, through their chairman, Dr. Brouardel, have requested the Ministers of War and of the Navy to lend their aid towards the passage of so important a measure. They have also recommended, among others, the addition of the following clauses: Sanitary or disinfecting work, found necessary in private houses, shall be executed at the landlord's expense; physicians shall declare the causes of all deaths, and shall report all cases of epidemic diseases as soon as they come to their knowledge.

Another case, in which a physician found himself confronted by the law of his country, is that of Dr. Poulet, of Plancher-les-Mines, whose name is probably familiar to the readers of the GAZETTE as a patient and original investigator. At his office he keeps a small stock of drugs and medicines for his own dispensing, as is his lawful right, there being no pharmacy within the legal distance. A physician in such a case is not allowed to keep open shop, and Dr. Poulet did not. In consequence he protested when, in 1888, a delegation from the Department School of Pharmacy came to inspect his stock of drugs. And when the inspectors tried to collect the statutory fee, he resisted payment, on the ground that he, not keeping open pharmacy, was not subject to inspection. From court to court the case was finally carried up, in August, 1890, as far as the Paris Council of State. The Council held that physicians keeping medicines for their own patients, in villages devoid of a pharmacy, as long as they have no open shop, cannot be submitted to an inspection instituted by law for watching over regular pharmacies. Hence the case was struck from the roll. The decision is an important precedent, as pharmacy inspectors claim that doctor's shops are, as a rule, badly kept, and need closer watching than regular stores. Perhaps they are not far from

wrong; but the question has been settled against them.

Fortunately, before the courts physicians seldom appear as defendants, but most usually as experts. We have here a society of forensic medicine (Société de Médecine légale) meeting in the Palais de Justice, and composed of eminent physicians and lawyers, before whom medico legal topics of general interest are often discussed. At the last sitting, Dr. Vibert related an unusual instance of spontaneous perforation of the stomach after death. Not long since he had to make the autopsy of a young man, aged 19, dead from a revolver-shot in the head. On examining the stomach, he found three perforations, corresponding with as many holes in the diaphragm, and the contents of the stomach drained into the left pleural cavity. At first sight the perforations might be supposed to have a traumatic origin. Only there was no sign of blood extravasation. On the other hand, there was no trace of ulcerous affection or corrosive poison. Evidently the gastric juice had simply digested holes into the stomachal membrane, and the action must have been a speedy one, as the body was yet in a good state of preservation. The attention of medical experts is called to the possibility of such post-mortem alterations, liable to mislead microscopists when the cause of death is doubtful. At the same meeting, Dr. Motet quoted several instances showing the unreliability of children's testimony, especially girls'. One case is striking enough to be worth relating. At Toulon there were several little girls, rather neglected and running wild, and probably addicted to mutual self-abuse. One day the mother of one of them, having noticed a suspicious vaginal discharge, took the child to a midwife, who declared the girl had been assaulted by a diseased man. The child at once said it was so, adding the crime was committed in the hall-way of a house which she designated, and two of her play-fellows confirmed the fact, stating, moreover, they could identify the man if they saw him. Soon a man was arrested, on the mother's indications, and things looked bad for him. Fortunately, the judge, an old and experienced man, mistrusting the little truants, caused one of them to be shown the court clerk as being the suspected prisoner. She immediately identified him as the fellow they met in the hall-way. In a different room the court-house fireman was presented to the other little girl, who, without hesitation, declared he was the hall-way stranger. Of course the prisoner was at once discharged; but had it not been for the judicial stratagem he might have found it difficult to establish his innocence.

The sensational debate about depopulation, in the Academy of Medicine, has led to many quack propositions and a few practical suggestions. The wise idea of stopping the waste of babies naturally called attention to criminal abortion. In this ample field courts have found their services needed, and numerous prosecutions are now in progress. With them, however, we are not concerned. The points of professional interest are that abortionists, as a rule, are outsiders; that no physician, no pharmacist, and but few midwives were found guilty of such practices; and that the regular "faiseurs d'anges" (angel makers), as they are popularly called, are herbalists, nurses, and ignorant persons. A good specimen of the genus is a woman, now in a Paris jail, charged with a long list of abortions. By occupation she is a bread-carrier, but, in her spare moments, would, in a back room of the bakery, consent to relieve servant-girls "in trouble." Probably her fees were low, as she is said to have had many customers. A most curious fact, though, was elicited during the preliminary investigation. A new way to dispose of fœtuses was voluntarily disclosed by one of the unfortunates. She confessed she bought a rose-bush, lifted it from the pot, buried the embryo under the roots, and carefully replaced the tree. Next she went to the Père-Lachaise Cemetery, and on a tomb planted the flower as a votive offering to some departed relative. No one suspected her; and she was in the habit of coming regularly to water the rose-bush marking the little one's grave. There is, no doubt, something touching in the poor girl's story. But the police, a hard, unpoetical set, now keep close watch over floral offerings brought to cemeteries, the more so that the girl in question is believed to have told her secret to others.

PARIS, FRANCE, November 21, 1890.

CAN THE CORPUSCLES OF THE BLOOD BE SEEN BY THE NAKED EYE UNASSISTED?

To the Editor of the THERAPEUTIC GAZETTE:

DEAR SIR:—My attention was called to this subject about a year ago by Professor J. E. Todd, of Tabor College. He asked me if I had seen anything on the subject in the course of my reading. I told him I had not. He then said he had noticed, while looking at a white wall or into blank space, with the ciliary tension equal to that of the eye during

a "brown study," bright dots or points of light pass before the field of vision, and gave it as his opinion that they were the blood-corpuscles passing through the vessels of the retina.

Since my attention was called to the matter I have noticed the phenomena many times. When the snow is on the ground it can easily be observed by assuming a "vacant stare" and casting the eyes downward, or by looking towards the horizon long enough after sunset for the *glare* to have passed away. But the ciliary tension must be at its minimum.

These bright spots or points of light will be observed to be darting hither and thither, backward and forward, resembling the swarming of bees. However, each follows a definite channel or course, and there is no collision or interference, each point following some other point in regular and endless succession.

The reader may think I am speaking of the muscæ volitantes, but the latter have a very slow movement which is dependent upon the movements of the eye and gravitation.

The blood-vessels of the retina, as we know, are situated anterior to the rods and cones, and consequently between them and the crystalline lens; and it was always a wonder to me why they did not interfere with vision, and were not seen instead of objects farther removed.

And now I am satisfied that the *contents*, at least, *can* be seen, and that the phenomenon I have observed was the passage of red blood-corpuscles through the vessels of the retina.

I contribute this that others may observe the same and deduct something practical therefrom.

Very respectfully,
E. T. CAMPBELL, M.D.

[Our correspondent is undoubtedly correct in the explanation which he offers of one of the well-recognized entoptical defects of the eye,—the perception of objects within the eye-ball. Not only may the outline of the retinal vessels be recognized (Purkinje's figures) by various methods, but an observer may see the blood circulating in his own eye by other methods than that described first by Boisser and referred to by Dr. Campbell. Thus, the same result may be obtained by looking at the sun through a dark-blue glass, without accommodating the eye, or by looking at a very brilliant light passing through a long tube, moving the head to and fro. The phenomenon has been explained by His as due to the fact that the red blood-corpuscles, in the capillaries posterior to the external granular layer of the retina, act as small light-collecting concave disks, concentrating the light falling upon them from bright surfaces, and throwing it upon the rods of the retina. Vierordt, in fact, projected the motion on a screen, and calculated the velocity of movement as about half a millimetre per second,—a rate which corresponds very closely with measurements made elsewhere. The occasional breaks in the chain of moving bright points is probably due to the rotation of the corpuscles, causing them to throw a shadow instead of transmitting a ray of light. We can think of no practical application of these facts, except that they show that the sensitive part of the retina is its deepest layer.—ED.]

Notes and Queries.

SEVENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

To the Editor of the THERAPEUTIC GAZETTE:

DEAR SIR:—I am requested by the Honorable Secretaries of the Committee of Organization of the Seventh International Congress of Hygiene and Demography to call attention to the fact that this Congress will be held in London during the week beginning August 10, 1891.

The governments of all countries and municipalities, and all public health authorities, universities, colleges, and societies occupied in the study of the sciences more or less immediately connected with hygiene, are invited to co-operate and appoint delegates to represent them at the Congress. The Prince of Wales will preside.

A Committee of Organization has been formed, of which Sir Douglas Galton is chairman and Professor W. H. Corfield and Mr. Shirley F. Murphy are honorary secretaries. An exhibition of articles of hygienic interest will be held in connection with the Congress. The last of these Congresses was held in Vienna in 1887, and was attended by over two thousand persons, and it is expected that the London meeting will be one of great magnitude and importance.

Very respectfully,
JOHN S. BILLINGS, M.D.,
Member of the International Permanent Committee.

WASHINGTON, D. C., October 27, 1890.

SHOULD MORPHINE AND ATROPINE BE GIVEN BEFORE CHLOROFORM INHALATION?

It has been claimed by several writers that the effects of chloroform inhalation are more quickly produced, and the anæsthetic influences of a given quantity of the drug prolonged, if a dose of morphine be given before the beginning of inhalation. This statement has naturally found its way into standard text-books. Thus Bartholow says, "Before the administration of chloroform morphine should be injected hypodermically to diminish the dangers of the inhalation, and to secure relief to the after-pain of the surgical operation;" and again, "When this is done a much less quantity of the anæsthetic is needed to induce insensibility, and the stage of narcosis is sufficiently prolonged for ordinary surgical operations without requiring renewed administration of the ether or chloroform."

In *L'Union Médicale*, August 5, 1890, is published a discussion which took place in the Paris Society of Surgery upon a paper treating of the use of hypodermics of morphine and atropine before the inhalation of chloroform. The author of the paper, M. REGNIER, was led to try this method in his practice by the recommendation of M. Dastre, who reported favorable results from its use in animals, and of M. Aubert, a surgeon, who stated that narcosis and awaking were both facilitated by the injection of ¼ grain morphine muriate and $\frac{1}{25}$ grain atropine sulphate fifteen or twenty minutes before the operation, and that inconvenient results were observed but rarely. M. Regnier used this method with a number of patients, until, unfortunately, a fatal accident occurred.

A feeble girl, aged 16, was affected with tubercular disease of the bones of the foot, and, as the lungs presented but a few râles in the apex of one side, he decided to chisel out the cuboid bone. Half an hour before the operation he gave a hypodermic injection of $\frac{1}{12}$ grain of morphine and $\frac{1}{250}$ grain of atropine. Anæsthesia was easily induced, and not more than from 5 to 7 fluidrachms of chloroform were required for the whole operation, which lasted only a few minutes. About ten minutes after the chloroform had been removed, and while the dressings were being applied, she opened her eyes without speaking, and she was then carried to her ward. Three minutes later news was brought that she had ceased breathing. Upon reaching her bed he found the respirations very infrequent. They ceased suddenly as the pulse disappeared, although feeble heart-beats were still heard. The pupil then quickly dilated. Protracted artificial respiration seemed, at the end of half an hour, to excite spontaneous respiration, but this soon failed, although supplemented by ether injections and other measures. Post-mortem examination showed anæmia of the cerebral hemispheres and medulla oblongata.

Death in this case came on very slowly from chloroform intoxication. It was quite remarkable that life could be prolonged for more than twenty minutes by artificial respiration. It was claimed that the chloroform must have been eliminated slowly, and that the elimination was rendered more slow than it would otherwise be by the influence of the morphine and atropine.

Two members of the Society reported that they had observed, in experiments on dogs, that morphine and atropine given before the chloroform produced no reflex phenomena at the beginning, but rendered more grave such complications as appeared at the end. In some cases there was quite protracted and severe dyspnœa. In dogs thus treated very little chloroform was needed; in men more was required. It appeared to be conceded that the method was useful in the laboratory, but not in the clinic, as the chances of intoxication were increased.

Another member who had tried the method stated that in male patients nothing worthy of note was usually observed; while in female patients the awaking was much more slow than with chloroform alone. He thought women were more sensitive than men to the influence of atropine. Out of five cases he had lost one patient. The operation was for nephrectomy, and lasted an hour, 15 fluidrachms of chloroform being used. After a short awakening the respiration began to fail, cyanosis appeared, and, in spite of all measures, death occurred in an hour and ten minutes.

Another member had used it in fifty or sixty cases. He did not notice any peculiarities, except that certain patients complained of insatiable thirst.

It was suggested, in conclusion, that the better results obtained with dogs might be due to the very large doses of atropine given (in proportion to the body-weight), which would be utterly out of the question in operations upon human beings.

Interesting as are these observations, and

salutary as warnings always are regarding the use of dangerous drugs, the experience of surgeons in New York does not bear out the objections urged against this long-tried and well-known method of mixed narcosis. It is true ether is the anæsthetic here, but it is equally true that no accidents have as yet occurred ; but, on the contrary, it has been found that anæsthesia can be more safely prolonged with less ether than under other circumstances, and that the patients are in a more comfortable condition after the operation. Particularly is this the case in operations upon the face, throat, and upper air-passages when the proper administration of ether is attended with unusual difficulty.—*New York Medical Record*, November 1, 1890.

THE COAGULATION OF THE BLOOD.

MM. ARTHUS and PAGÈS (Brown-Séquard's *Arch. de Phys.*, October) have propounded a new theory of the coagulation of the blood. Starting with the idea that the curdling of milk presents analogies with blood coagulation, these authors, after applying the same methods of investigation to the two processes, have arrived at the following conclusions : 1. Oxalates, fluorides, and alkaline soaps render blood non-spontaneously coagulable, even when added in very minute proportions. 2. It is upon fibrin-formation and not ferment-production that the action of these bodies is exerted. 3. These bodies produce this effect by removing soluble calcium salts from the blood. The addition of a trace of a soluble calcium salt renders blood once more coagulable after it has been rendered non-coagulable by the addition of soluble fluorides, oxalates, or soaps. The *rôle* of calcium can be played by strontium, but not barium or magnesium. 4. The ash of the most carefully washed fibrin contains calcium salts, and the amount of clot obtained is proportional to the amount of calcium when a minute amount only is present ; hence the molecule of fibrin contains calcium. This may be replaced by strontium. 5. The ferment is unable to act upon fibrinogen, except in the presence of a soluble calcium salt. 6. The rival theories of Al. Schmidt and Hammarsten are reconciled by adopting the view that fibrinogen undergoes in the presence of the ferment and of soluble calcium salts a transformation into an insoluble calcium compound,—fibrin. Schmidt's fibrinogen contained no calcium, while his fibrinoplastin did ; Hammarsten had no need of fibrinoplastin, for his fibrinogen contained the necessary lime. 7. The curdling of milk is due to a transformation of casein under the influence of a ferment, giving rise to the formation of an insoluble calcium compound. The clotting of blood is an analogous process. Green, of Cambridge, showed a few years ago that the presence of a minute quantity of calcium was essential for the production of a clot, but MM. Arthus and Pagès have much extended his observations.—*British Medical Journal*, October 25, 1890.

"IF YOU GO TO COLORADO YOU CAN NEVER RETURN."

The Seventh Annual Meeting of the American Climatological Association was held in Denver, Col., during the first week of September. The most interesting question under discussion, both to the physician and to the patient, was as to when a consumptive who has gone to Colorado can safely return to a lower altitude. It could not have failed to be suggestive to the very many consumptives who listened to this discussion to learn that physicians from Boston and other places along the sea-shore believed it safe for many patients to ultimately return to their homes ; while the doctors from the high altitudes held that it was unsafe for a consumptive ever to return to a low altitude except for short periods of from four to eight weeks during the usual vacation months of July and August. The personal interest which some physicians feel for their patients at times obscures their clear comprehension of the relations which various phases of treatment hold towards each other. So, in this instance, the question of altitude has been confounded with the question of climate.

It appears to us that the treatment of tuberculosis, whether of the lungs or other tissues, is of two kinds,—general and local. Under the general treatment comes the question of climate ; under the local, that of altitude. During the past years very considerable advances have been made in the general, or, as it may more properly be called, hygienic treatment of tuberculosis. It is now generally accepted that tuberculosis under favorable conditions is a self-limited disease, and that if the patient can be kept alive long enough he will get well. To this

end the hygienic treatment gives to the patient all that which will tend to improve his general well-being, such as proper and abundant food, the greatest possible number of hours in the open air and sunlight, the most perfect protection against colds and all provocatives of coughing, and such surroundings as shall be conducive to a cheerful frame of mind.

It is more than possible that these things cannot always be best obtained in high-altitude resorts. The local treatment consists in the application of certain medicaments, medicated air, dry air, hot air, the pneumatic cabinet, the rarefied air of high altitudes, etc. The confusion has, perhaps, arisen because it has not been recognized that the rarefied air of high altitudes acts in the same way as excitants to coughing,—namely, to increase the lung activity. Functional activity of a tissue infected with tuberculosis favors suppuration and a rapid elimination of the infecting germs; functional rest favors a slow elimination by starvation. In a tissue such as the lung, if the tubercular focus be small and localized, and if the patient's strength be still sufficient, the suppuration and rapid elimination which the rarefied atmosphere of high altitudes gives favors a rapid and perfect cure. In support of this, we find a unanimity of opinion among the members of the Association that cases of pulmonary tuberculosis coming to Colorado sufficiently early, as a rule, permanently recover. On the other hand, if the tubercular infiltration be diffuse, if the patient's strength be not good, or if the disease be well advanced, the functional activity induced by rarefied air tends to a rapid termination of the life of the patient. In this, too, the members were agreed that many cases of phthisis in an advanced stage were made worse by going to Colorado. In a word, it would appear that there are certain cases that are more rapidly cured, and other cases that are more rapidly killed, in a high than in a low altitude.—*Medical Record*, November 8, 1890.

DR. KOCH'S INVESTIGATIONS UPON THE TREATMENT OF TUBERCULOSIS.

It may be remembered that, at the International Congress, PROFESSOR R. KOCH excited much laudable curiosity by detailing his experiments to discover a substance which, when injected into the body, should have the effect of destroying the bacillus of tubercle without injuring the animal operated upon. He stated that he had found various substances to be remedies which hinder the growth of tubercle bacilli in tube cultures,—a number of ethereal oils,—among the aromatic compounds β-napthylamin, paratoluidin xylidin; some of the so-called tar dyes,—namely, fuchsin, gentian violet, methyl blue, chinolin yellow, aniline yellow, auramin; among the metals, mercury in the form of vapor, silver and gold compounds. The compounds of cyanogen and gold were especially conspicuous, their effects surpassing that of all other substances; even in a dilution of one to two millions they checked the growth of tubercle bacilli. But all these substances, though effective in tube cultures, were absolutely without effect if tried on tuberculous animals. But Dr. Koch was too far successful to be discouraged, and he thinks he has hit on a substance which has the power of preventing the growth of the tubercle bacillus, not only in a test-tube, but in the body of an animal. Even guinea-pigs, which are extraordinarily susceptible to tuberculosis, if exposed to this substance, cease to react to the inoculation of the tuberculous virus; and, still more, guinea-pigs actually suffering from general tuberculosis, even to a high degree, have the morbid process arrested, without the body being in any way injuriously affected. We have not had to wait long for the promised trial on the human subject of the efficacy of this method to restrain the development of the bacillus. Such a trial was made in the wards of La Charité, and with such promising result (according to the *Nationale Zeitung*) that Dr. Koch has been granted a prolonged leave of absence from his professional duties to enable him to pursue his investigations on a wider scale. The vast importance of the possible results of such an inquiry upon the welfare of thousands renders it all the more necessary for the world at large to imitate the caution and reticence of Koch himself, bearing in mind that hitherto he has not overstepped the limits of justifiable inference, and that he would be the first to deprecate either haste in drawing conclusions or a premature adoption of a method on which so much depends. Indeed, apart from the fact that we may be on the verge of a revolution in therapeutics, it may be said that bacteriology itself is on its trial in this momentous investigation.—*Lancet*, November 1, 1890.

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The value of ARISTOL can scarcely be over-estimated, as we have in it a drug possessing the good properties of Iodoform, but free from its toxic qualities. Its freedom, too, from any suspicious odor will be at once appreciated, both by the physician and his patient.

ARISTOL, prepared by the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, is supplied by us in ounces.

SULFONAL-BAYER.

The value of Sulfonal in children's diseases.—DR. WILLIAM C. WILE sent a paper with this title to the American Medical Association, in which he stated that sulfonal was the ideal hypnotic. It was without the bad effects of opium and the uncertainty of the bromides. It could be given in ten-grain doses. It quieted reflex irritability. It did not constipate nor disturb the stomach. In one case in which a drachm was taken accidentally in ten-grain doses, there was a deep slumber lasting twenty-four hours, slight fever, but a normal pulse and respiration.—*Medical Record*, New York.

DR. HENRY M. FIELD, in a paper presented to the American Medical Association, says: "Clinically observed, we recognize in Sulfonal a mild calmative, *a slowly but progressively acting hypnotic;* it has no other action, and its operation is attended by no complications, near or remote. It is therefore a pure hypnotic, and, we submit, it is the only pure hypnotic we possess, up to date."—*New England Medical Monthly.*

Sulfonal-Bayer, prepared by the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, is supplied by us in ounces and in the form of Tablets of 5, 10, and 15 grains, put up in bottles of 10 and 100 tablets each.

We also offer Sulfonal-Bayer in the form of our soluble pills, containing 5 grains each.

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Phenacetine in Insomnia.—DR. F. PEYRE PORCHER, of Charleston, S. C., writes: "I desire to call special attention to the extreme value of Phenacetine as a remedy for insomnia. Given at night in a little water it is tasteless, innocuous, and induces sleep. I am confident, also, after repeated trials, that it is the best and most unobjectionable substitute for morphia. It causes sleep, when, of course, pain is in abeyance, unless the pain be more than ordinary, and morphia hypodermically may then be required. The remedy may be repeated and the dose increased to seven or ten grains.

Suffering from chronic rheumatism of the forearm, I have tested it repeatedly in my own person, and have given it to many who have suffered from insomnia, or inability to sleep from any transient cause, fatigue, nervousness, excitement, etc., in either sex." * * * * *—*Medical Record*, New York.

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Fig. 1.

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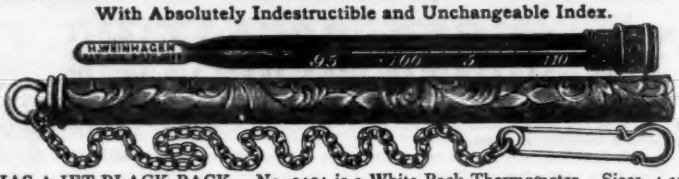

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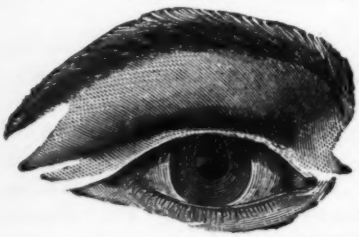

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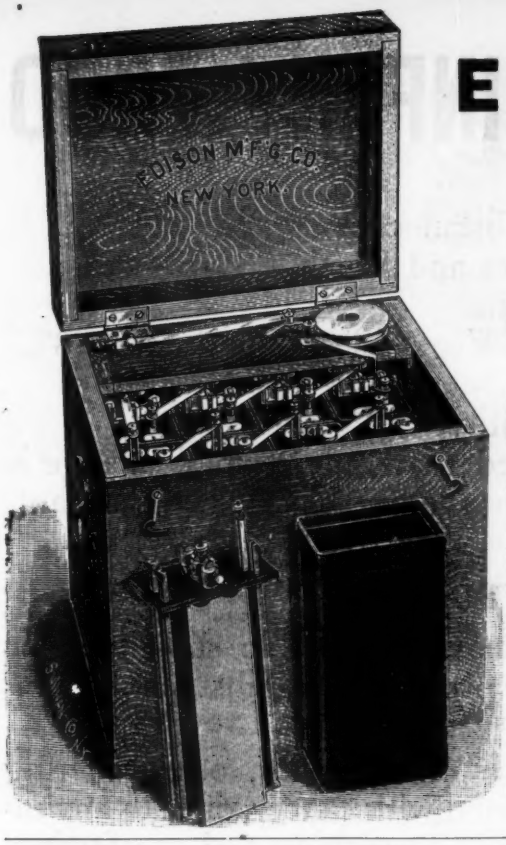

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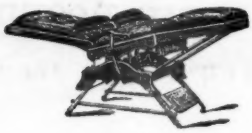

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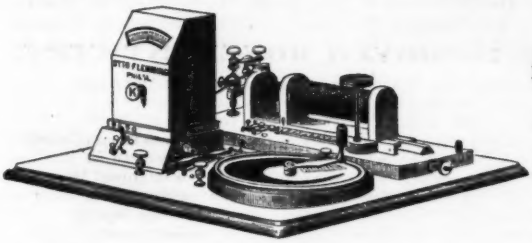

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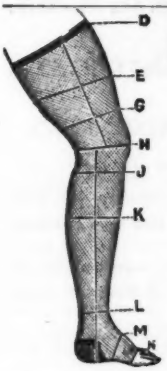

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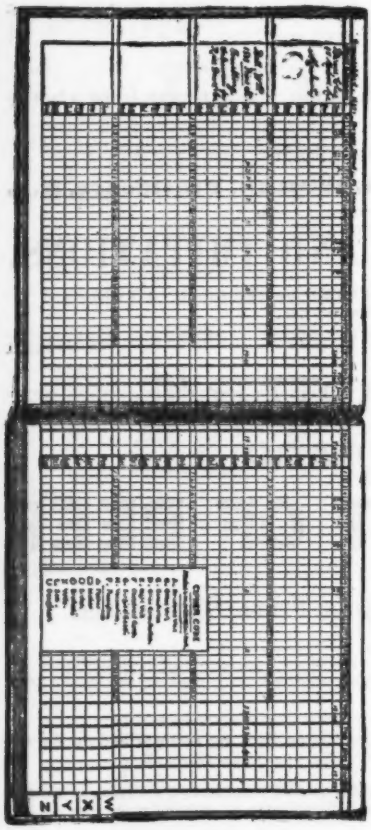

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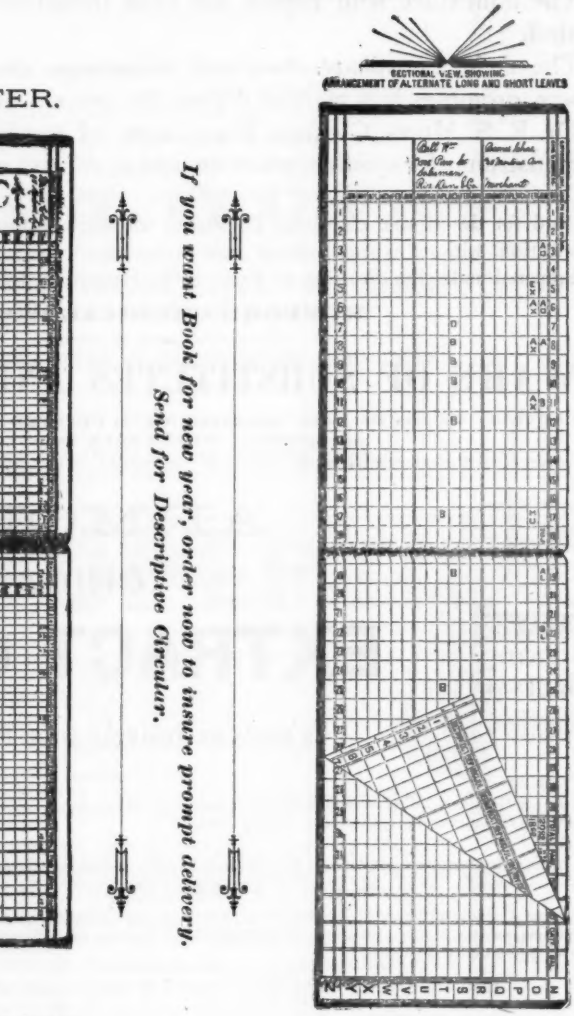

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"Now, if diphtheria be at first a local disease, and be auto-infectious; that is, if it be propagated to the general organism by a contagious virus located about the tonsils, and if this virus be, as it really is, an albuminoid substance, it may and will be destroyed by this agent upon a sufficient and a sufficiently repeated contact. . . .

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